PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

FILED
9-02-14
10:25 AM

September 2, 2014

TO PARTIES OF RECORD IN INVESTIGATION 12-01-007:

This proceeding was filed on January 12, 2012, and is assigned to Commissioner Peevey and Administrative Law Judge (ALJ) Mark S. Wetzell. This is the decision of the Presiding Officer, ALJ Mark S. Wetzell.

Any party to this adjudicatory proceeding may file and serve an Appeal of the Presiding Officer's Decision (POD) within 30 days of the date of issuance (i.e., the date of mailing) of this decision. In addition, any Commissioner may request review of the POD by filing and serving a Request for Review within 30 days of the date of issuance.

Appeals and Requests for Review must set forth specifically the grounds on which the appellant or requestor believes the POD to be unlawful or erroneous. The purpose of an Appeal or Request for Review is to alert the Commission to a potential error, so that the error may be corrected expeditiously by the Commission. Vague assertions as to the record or the law, without citation, may be accorded little weight.

Appeals and Requests for Review must be served on all parties and accompanied by a certificate of service. Any party may file and serve a Response to an Appeal or Request for Review no later than 15 days after the date the Appeal or Request for Review was filed. In cases of multiple Appeals or Requests for Review, the Response may be to all such filings and may be filed 15 days after the last such Appeal or Request for Review was filed. Replies to Responses are not permitted. (See, generally, Rule 14.4 of the Commission's Rules of Practice and Procedure at www.cpuc.ca.gov.)

If no Appeal or Request for Review is filed within 30 days of the date of issuance of the POD, the decision shall become the decision of the Commission. In this event, the Commission will designate a decision number and advise the parties by letter that the POD has become the Commission's decision.

/s/ MARYAM EBKE for
Timothy J. Sullivan, Chief (Acting)
Administrative Law Judge

TJS:jt2
Attachment

ALJ/MSW-POD/jt2

Decision **PRESIDING OFFICER'S DECISION (Mailed September 2, 2014)**

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Investigation on the Commission's Own Motion into the Operations and Practices of Pacific Gas and Electric Company to Determine Violations of Public Utilities Code Section 451, General Order 112, and Other Applicable Standards, Laws, Rules and Regulations in Connection with the San Bruno Explosion and Fire on September 9, 2010.	Investigation 12-01-007 (Filed January 12, 2012)

(List of Parties: See Appendix A)

PRESIDING OFFICER'S DECISION REGARDING ALLEGED VIOLATIONS BY PACIFIC GAS AND ELECTRIC COMPANY IN CONNECTION WITH THE SAN BRUNO EXPLOSION AND FIRE

Table of Contents

Title **Page**

PRESIDING OFFICER'S DECISION REGARDING ALLEGED VIOLATIONS BY PACIFIC GAS AND ELECTRIC COMPANY IN CONNECTION WITH THE SAN BRUNO EXPLOSION AND FIRE 1
1. Summary 2
2. Factual and Jurisdictional Background 2
2.1. The San Bruno Disaster 3
2.2. Natural Gas Pipeline Safety Regulatory Framework 4
2.2.1. State Regulation 4
2.2.2. Federal Regulation 5
2.2.3. State and Federal Coordination 6
2.3. Overview of PG&E's Gas Transmission System 7
2.3.1. Line 132, Segment 180 7
2.3.2. Supervisory Control and Data Acquisition System, Gas Control, and Geographical Information System 8
2.3.3. Milpitas Terminal 9
2.4. Events of September 9, 2010 10
3. Procedural Background 11
3.1. Overview of This Proceeding 11
3.2. Related Actions and Proceedings 13
3.3. Fines and Remedies Issues 15
3.4. Parties 15
3.5. Testimony and Witnesses 16
3.6. Hearings 17
3.7. Briefs 18
3.8. Positions of the Parties 19
3.9. Extension Orders 21
4. Legal and Other Issues of General Applicability 21
4.1. Root Cause of the San Bruno Explosion and Fire 21
4.2. Section 451 23
4.2.1. Introduction 23
4.2.2. Statutory Construction 24
4.2.3. Nature of the Section 451 Safety Obligation 26
4.2.4. Precedent for Applicability of Section 451 29
4.2.5. Alleged Vagueness and Lack of Notice 34

Table of Contents (cont.)

Title **Page**

4.2.6. Conclusion: Section 451 Creates a Safety Obligation 36
4.3. Burden and Standard of Proof 37
4.3.1. Introduction 37
4.3.2. PG&E's Proposed Exception 38
4.3.3. TURN's Positions 41
4.3.4. CCSF's Position 42
4.4. PG&E's Lack of Knowledge of Unsafe Conditions 42
4.4.1. CPSD's Position 42
4.4.2. PG&E's Position 43
4.4.3. Discussion 45
4.5. Adequacy of Notice of Alleged Violations 49
4.5.1. Overview 49
4.5.2. PG&E's Motion to Strike Appendix C 50
4.5.3. Is Section X the Sole Source of Notice? 51
4.5.4. Did CPSD Improperly Make Post-Hearing Allegations? 54
4.5.5. PG&E's Request to Strike or Ignore Revised Appendix C 59
4.6. Authority of Intervenors to Allege Violations 60
4.7. Continuing Violations 62
4.8. Laches 64
4.9. Remedial Measures 65
4.10. Credibility and Knowledge of PG&E Witnesses 68
5. CPSD's Alleged Violations 73
5.1. Construction of Segment 180 73
5.1.1. Overview 73
5.1.2. Pressure Test 74
5.1.3. Visual Inspection 79
5.1.4. Minimum Length 80
5.1.5. Required Yield Strength 81
5.1.6. Unknown Yield Strength 82
5.1.7. Wall Thickness 84
5.1.8. Girth Weld Quality 86
5.1.9. Establishment of Design Pressure and MAOP 89
5.1.10. Unsafe Condition of Segment of 180 91
5.2. PG&E's Integrity Management Program 94

Table of Contents (cont.)

Title **Page**

5.2.1. Overview 94
5.2.2. General Integrity Management Issues 95
5.2.2.1. Effective Date of the Integrity Management Rule 95
5.2.2.2. Integrity Management Audits 96
5.2.2.3. Industry Practices 98
5.2.3. Alleged Data Gathering and Integration Violations 99
5.2.3.1. Introduction 99
5.2.3.2. Use of Conservative Assumptions 101
5.2.3.3. 49 CFR 192.107 Yield Strength Requirements 104
5.2.3.4. Missing and Inaccurate Data 105
5.2.3.4.1. GIS 105
5.2.3.4.2. The Alleged Violation 105
5.2.3.4.3. Data Quality and Accuracy 106
5.2.3.4.4. Leak Data 109
5.2.3.4.5. Two-Step Implementation 110
5.2.3.4.6. Conclusion - Missing and Inaccurate Data 112
5.2.3.5. Data Checking and Verification 112
5.2.4. Alleged Threat Identification Violations 113
5.2.4.1. Introduction 113
5.2.4.2. Seam Weld Defects 114
5.2.4.2.1. The Alleged Violation 114
5.2.4.2.2. Leak Records and Manufacturing Threats 116
5.2.4.2.3. 1988 Seam Defect 118
5.2.4.2.4. 1948 Seam Defects 120
5.2.4.2.5. Other Seam Defects 122
5.2.4.2.6. Conclusion - Seam Weld Defects 124
5.2.4.3. Cyclic Fatigue 125
5.2.4.4. DSAW Pipe 129
5.2.4.4.1. DSAW Pipe and Long Seam Manufacturing Defects 129
5.2.4.4.2. Increased Operating Pressure in 2003 and 2008 133

Table of Contents (cont.)

Title **Page**

5.2.4.4.3. Baseline Assessment Method 139
5.2.4.5. ERW Pipe 141
5.2.5. Alleged Risk Assessment Violations 143
5.2.5.1. Introduction 143
5.2.5.2. Use of Unsubstantiated Data 143
5.2.5.3. Risk Assessment Considerations 144
5.2.5.4. Risk Ranking Algorithms 145
5.2.5.5. Planned Pressure Spikes 148
5.3. SCADA System and the Milpitas Terminal 151
5.3.1. Overview 151
5.3.2. Clearance to Replace Temporary UPS 153
5.3.3. Clearance Procedure Failure as Unsafe Condition 156
5.3.4. Procedures for Abnormal Conditions 156
5.3.5. Milpitas Terminal Conditions 158
5.3.6. SCADA Alarm Design 162
5.4. PG&E's Emergency Response Procedures and Actions 164
5.4.1. Overview 164
5.4.2. General Emergency Response Issues 165
5.4.2.1. Federal Emergency Response Regulations 165
5.4.2.2. Continuing Emergency Response Violations 166
5.4.2.3. CPCS Audits 167
5.4.2.4. Duty to Follow Emergency Response Plans 168
5.4.2.5. Notice of Alleged Emergency Response Violations 169
5.4.3. Alleged Violations of Emergency Response Requirements 170
5.4.3.1. Plan Inconsistencies 170
5.4.3.2. Mutual Assistance Agreements 171
5.4.3.3. Operational Awareness and Internal Communications 172
5.4.3.3.1. Events of September 9, 2010 172
5.4.3.3.2. Prompt and Effective Response 182
5.4.3.3.3. Notices of Emergency 182
5.4.3.3.4. Provision of Resources 183
5.4.3.3.5. Shutdown of Pipeline 183

Table of Contents (cont.)

Title **Page**

5.4.3.3.6. Making Hazards Safe 183
5.4.3.3.7. Notification of First Responders 184
5.4.3.3.8. Adequacy of Procedural Manual 185
5.4.3.4. External Communications 187
5.4.3.4.1. Introduction 187
5.4.3.4.2. Communication With Local First Responders 188
5.4.3.4.3. Protection Priorities 188
5.4.3.4.4. Liaison With Local First Responders 188
5.4.3.5. Training and Public Awareness 189
5.4.3.5.1. Emergency Response Training 189
5.4.3.5.2. Reviews of Effectiveness 191
5.4.3.5.3. Public Awareness 191
5.4.3.6. Drug and Alcohol Testing 193
5.4.3.6.1. Milpitas Terminal Employees 193
5.4.3.6.2. Gas Control Staff 194
5.4.3.7. Unsafe Conditions Due to Emergency Response Deficiencies 194
5.5. PG&E's Safety Culture and Financial Priorities 194
5.5.1. Overview 194
5.5.2. Notice of Alleged Violation 195
5.5.3. Imputed/Adopted Safety-Related Costs 198
5.5.4. Did PG&E Reduce Safety Spending in Violation of Section 451? 200
5.5.5. Continuing Violation 206
6. Intervenors' Alleged Violations 207
6.1. Allegations Raised by TURN 207
6.2. Allegations Raised by CCSF 207
6.3. Allegations Raised by CSB 207
7. Transcript Corrections 208
8. Conclusion 208
9. Assignment of Proceeding 209
Findings of Fact 209
Conclusions of Law 231

Table of Contents (cont.)

Title **Page**

ORDER 239

Appendix A - List of Appearances
Appendix B - Table of Violations and Offenses

PRESIDING OFFICER'S DECISION REGARDING ALLEGED VIOLATIONS BY PACIFIC GAS AND ELECTRIC COMPANY IN CONNECTION WITH THE SAN BRUNO EXPLOSION AND FIRE

1. Summary

The Commission finds that Pacific Gas and Electric Company (PG&E) has violated Section 451 of the Public Utilities Code and regulations set forth in Title 49 of the Code of Federal Regulations. PG&E committed the violations in connection with the 1956 construction of a segment of natural gas transmission pipeline in San Bruno, California and in connection with the operation and maintenance of its natural gas transmission system for decades leading to the September 9, 2010 pipeline rupture, explosion and fire in San Bruno. This decision finds that PG&E committed 32 violations, many of them continuing for years, and a total of 59,255 separate offenses under Public Utilities Code Section 2108.

The proceeding remains open to consider, in a separate decision, monetary fines and other remedies to be imposed on PG&E in light of this decision as well as decisions addressing alleged violations in investigations into other aspects of PG&E's gas transmission system—Investigation (I.) 11-02-016 and I.11-11-009.

2. Factual and Jurisdictional Background

To establish context for the remainder of the decision, we provide brief overviews of the San Bruno explosion and fire, the gas pipeline safety regulatory framework, Pacific Gas and Electric Company's (PG&E) gas transmission system, and the events of September 9, 2010. This background section does not resolve contested issues related to these topics.

2.1. The San Bruno Disaster

At 6:11 p.m. on September 9, 2010, Segment 180 of Line 132, a 30-inch diameter natural gas transmission pipeline owned and operated by PG&E, ruptured in the Crestmoor neighborhood of San Bruno, California. Gas escaping from the rupture ignited. There was an explosion of such tremendous force that a crater approximately 72 feet long by 26 feet wide was created. A 28-foot long section of pipe weighing about 3,000 pounds was blown approximately 100 feet from the crater. The conflagration continued for over an hour and a half, releasing 47.6 million cubic feet of flammable natural gas before the flow was stopped. It required the response of 600 firefighting (including emergency medical service) personnel and 325 law enforcement personnel.

The resulting deaths, injuries, and damage to property were especially severe. The explosion and fire caused the deaths of eight people: Gregory Bullis, William Bullis, Lavonne Bullis, James Franco, Jacqueline Greig, Janessa Greig, Jessica Morales, and Elizabeth Torres. The explosion and fire caused serious injuries to ten people and moderate injuries to 48 people. At least 15 victims were taken by ambulance to nearby hospitals, including four who were sent to a burn center in San Francisco. At least three victims were burned on over 50 percent of their bodies and at least one other had burns on 40 percent of the body. Several survivors endured months of hospitalization and rehabilitation, and still face long and difficult recoveries. Survivors experienced loss, emotional trauma, stress, acute insomnia, and post-traumatic stress disorder.

The explosion and fire caused the destruction of 38 homes, moderate to severe damage to 17 homes, and minor damage to 53 homes. About 300 homes were evacuated. The Crestmoor neighborhood was effectively wiped off the map. An entire community was displaced. For some residents, weeks passed

before it was possible to return and assess the damage. City infrastructure was destroyed, including water and sewer lines, storm drains, sidewalks and surfaces, streetlights, and vegetation.

2.2. Natural Gas Pipeline Safety Regulatory Framework

2.2.1. State Regulation

The California State Constitution, Article XII and Section 222[1] (defining "gas corporation") gives the Commission authority over natural gas operators in California. Section 701 empowers the Commission to do "all things. . . necessary and convenient" in the exercise of its powers and jurisdiction. Section 768 authorizes the Commission to promote and safeguard the health and safety of the public by establishing uniform standards for construction and maintenance of utility equipment and plant. Section 451 requires all public utilities to provide and maintain "adequate, efficient, just, and reasonable" service and facilities as are necessary for the "safety, health, comfort, and convenience" of its customers and the public. With respect to the alleged violations at issue here, since 1994 a violation of the Public Utilities Code or a Commission decision or order is subject to fines of $500 to $20,000 for each violation, for each ongoing day, pursuant to Sections 2107 and 2108. Prior to 1994, the maximum daily penalty was $2,000.

Pursuant to its constitutional and statutory mandate, the Commission created General Order (GO) 112 in 1960 (effective July 1, 1961). It governs natural gas pipeline safety, including the design, construction, operation, and maintenance of natural gas pipelines in California. GO 112 incorporated with certain modifications the standards put forth by the American Society of

[1] All code section references are to the Public Utilities Code unless otherwise stated.

Mechanical Engineers (ASME) that were followed by the industry at that time (ASME B31.8; also referred to as American Standards Association (ASA) B31.1.8). GO 112 has been updated several times. The Commission approved GO 112-C effective in 1971, incorporating new federal pipeline safety rules in Title 49 of the Code of Federal Regulations (CFR), Part 192[2] and deleting references to ASME B31.8. GO 112-E, adopted in 1995, remains in effect and was last revised in 2008.

2.2.2. Federal Regulation

Pursuant to the Natural Gas Pipeline Safety Act (NGPSA) of 1968, 49 U.S.C. §§ 60101 et seq., the federal government regulates the safety of transportation of natural gas pipelines. The NGPSA was the first comprehensive federal pipeline safety law. As set forth in the act, its purposes are "to provide adequate protection against risks to life and property posed by pipeline transportation and pipeline facilities by improving the regulatory and enforcement authority of the Secretary of Transportation." 49 U.S.C. § 60102(a)(1).

In November 1968, the Secretary of Transportation adopted existing state regulations, including the Commission's, as interim standards, recognizing that a majority of the states utilized the standards contained in the 1968 edition of ASME B31.8. In August 1970, the Office of Pipeline Safety (OPS) within the Department of Transportation promulgated final rules at 49 CFR Parts 191 and 192, establishing minimum federal safety standards, including reporting

[2] Title 49 of the Code of Federal Regulations is cited as "49 CFR" and parts and sections of the code are cited as "49 CFR xxx."

requirements (Part 191) and design, construction, operation, and maintenance requirements for natural gas pipeline facilities (Part 192).

In 1994, Congress merged the NGPSA and the Hazardous Liquid Pipeline Safety Act under the Pipeline Safety Act. Eight years later, Congress enacted the Pipeline Safety Improvement Act in 2002, establishing integrity management requirements for gas transmission pipelines in high-consequence areas (HCAs). Integrity management regulations require pipeline operators to provide an extra layer of protections for pipelines in areas in which a greater population density increases the potential consequences if an incident occurs. Congress subsequently created the Pipeline and Hazardous Materials Safety Administration (PHMSA) in 2004.[3]

Effective in February 2004, OPS established the Gas Transmission Integrity Management Rule (49 CFR 192, Subpart O). The rule specifies how pipeline operators must identify, prioritize, assess, evaluate, repair and validate the integrity of gas transmission pipelines that could, in the event of a leak or failure, affect HCAs within the United States. The integrity management regulations include requirements for threat analysis, risk ranking, assessment methods and re-assessment timetables.

2.2.3. State and Federal Coordination

In order to enforce the federal regulations as to intrastate pipelines, state regulatory agencies, such as the Commission, must become certificated by PHMSA under 49 U.S.C. § 60105, providing the state adopts the minimum

[3] As explained on the PHMSA website, Frequently Asked Questions page, of which we take official notice, "PHMSA comprises two safety offices, the Office of Pipeline Safety and the Office of Hazardous Material Safety."

federal standards. States may adopt more stringent standards where appropriate. The Commission has been certificated and applies the federal pipeline safety regulations contained in 49 CFR 192.

2.3. Overview of PG&E's Gas Transmission System

2.3.1. Line 132, Segment 180

PG&E's Peninsula transmission system consists of three transmission lines: Line 101, Line 109, and Line 132. Cross-ties between the three lines allow the flow of gas between them. The lines all originate at the Milpitas terminal, which is located about 39 miles southeast of the San Bruno accident site. Natural gas flows through all three lines from south to north, terminating at PG&E's gas load center near the Potrero Power Plant in San Francisco.

Line 132 was constructed in multiple phases from 1944 through 1948 and consists of 22-inch, 24-inch, 30-inch, 34-inch, and 36-inch diameter segments. The segment of Line 132 that ruptured in San Bruno, Segment 180, was installed in 1956 as part of a relocation project of approximately 1,851 feet of Line 132 that had been originally constructed in 1948. The relocation, starting north of Claremont Drive and extending south of San Bruno Avenue, moved the pipeline from the east side to the west side of Glenview Drive. The relocation was necessary because of grading associated with land development in the vicinity of the existing pipeline.

The National Transportation Safety Board (NTSB) discovered after the incident that one 23-foot section of pipe installed in Segment 180 contained six short lengths of pipe known as "pups" in the area of the rupture that included the origin of the fracture. The pups ranged from 3.5 to 4.7 feet in length.

2.3.2. Supervisory Control and Data Acquisition System, Gas Control, and Geographical Information System

Supervisory Control and Data Acquisition (SCADA) is the use of computers and communications networks to gather field data from numerous remote locations, perform numerical analysis, and generate trends and summary reports. SCADA is employed for many different processes, such as management of electric power lines, operation of oil refineries, and operation of automobile assembly plants. SCADA systems make it possible to control a process that is distributed over a large area with a small group of people located in a single room.

PG&E's gas SCADA system monitors and controls 6,438 miles of transmission pipeline. SCADA reports are displayed in a structured format to enhance Gas Control Operators' ability to monitor, forecast and send commands to field equipment. Some pipelines span long distances and are usually operated from a central location using a SCADA system. About 9,000 sensors and devices are installed along the length of the pipelines to enable the display of flow rates, equipment status, valve position status, pressure set points, and pressure control among other data. The current generation of SCADA used by PG&E is based on Citect software from Schneider Electric.

PG&E's pipelines are controlled and managed from the Primary Gas Control Center (Gas Control) located in San Francisco with an alternate (duplicate) control center located in Brentwood.[4] Several compressor stations

[4] We take official notice that PG&E has opened a new gas control headquarters in San Ramon, California. *PG&E Opens a New Gas Pipeline Control Center*, San Jose Mercury News (on-line edition), September 5, 2013.

and local control stations, such as the Milpitas Terminal are situated along the pipelines, each with a separate local control system.

The SCADA system is separate from PG&E's Geographical Information System (GIS). GIS data are displayed on separate computer screens at each of the operator consoles at both the primary and alternate gas control centers.

The SCADA system is programmed to register alarms when the pressure exceeds the Maximum Allowable Operating Pressure (MAOP) or if the value is less than preset low levels. The operational decisions are made by PG&E Gas Operators in charge of the five consoles at the Gas Control Center.

Monitor valves act as limiting devices to protect against accidental overpressure for the outgoing gas pipelines. Regulator valve set points for outgoing lines can either be manually set at the Milpitas Terminal or remotely set through SCADA by PG&E Gas Control.

2.3.3. Milpitas Terminal

The Milpitas Terminal has four incoming natural gas transmission lines and five outgoing natural gas transmission lines, including Lines 101, 109, and 132. It is equipped with pressure regulation and overpressure protective devices to control incoming and outgoing pressure. The pressure regulating valves are electrically actuated with the SCADA system controls while the monitor valves are pneumatically controlled.

Each of the incoming pipelines to the Milpitas Terminal has regulating and monitor valves to limit the pressure within the terminal. Pressure is further reduced with a second regulating valve and a monitor valve for overpressure protection before it is sent through the outgoing lines. The monitor valves are normally left fully open. When the downstream pressure starts to increase and

exceed a pressure set point, the monitor valve moves to control the downstream pressure.

2.4. Events of September 9, 2010

An Uninterruptible Power Supply (UPS) system at the Milpitas Terminal provides temporary power for the SCADA and control equipment during a power outage before emergency generators start delivering backup power. On March 31, 2010 the UPS failed to function properly. On April 1-2, 2010 PG&E installed three temporary mini-UPS units to provide temporary backup power.

During the afternoon of September 9, 2010, PG&E personnel were working on the Milpitas Terminal UPS system. At 5:22 p.m., the SCADA center alarm console displayed over 60 alarms within a few seconds, including controller error alarms and high differential pressure and backflow alarms from the Milpitas Terminal. These alarms were followed by pressure alarms on several lines leaving the Milpitas Terminal, including Line 132. PG&E later determined that the error alarms were related to power supply unit power fluctuations. Records of SCADA alarms and pressure readings indicate valves opening and pressure increasing at 5:23 p.m. Pressure readings on Lines 132, 101, and 109 increased from 370 pounds per square inch gage (psig) to 380 psig in about 90 seconds. The highest pressure recorded at an upstream location closest to Segment 180 just prior to the failure was 386 psig.

After the rupture and explosion occurred, about 95 minutes passed before PG&E isolated the rupture to stop the flow of gas. This contributed to the

severity and extent of property damage, according to an investigative report by the NTSB (NTSB Report).[5]

3. Procedural Background

3.1. Overview of This Proceeding

On January 12, 2012, following an investigation of the San Bruno explosion and fire and PG&E's gas transmission system conditions, operations and safety practices, the Commission's Consumer Protection and Safety Division (CPSD)[6] issued its investigative report (CPSD Report). The CPSD Report alleged that PG&E violated the California Public Utilities Code, various federal and state pipeline safety regulations, and accepted industry standards.

On the same day that CPSD issued its report, the Commission opened this formal investigative proceeding to review PG&E's operations and practices and to determine whether PG&E violated Public Utilities Code Section 451, GO 112, and other applicable standards, laws, rules and regulations in connection with the San Bruno explosion and fire. In addition to the CPSD Report, the Order Instituting Investigation (OII) referenced and took note of the NTSB Report and a report by the Independent Review Panel (IRP) established by Commission Resolution L-403 (IRP Report). Summarizing the purpose of the investigation, the Commission stated:

---

[5] National Transportation Safety Board. 2011. *Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, California, September 9, 2010*. Pipeline Accident Report NTSB/PAR-11/01. Washington, DC. The NTSB Report was received in evidence as Exhibit CPSD-9.

[6] As of January 1, 2013, CPSD has been renamed the Safety and Enforcement Division (SED). However, for consistency and to avoid confusion, this decision refers to SED by its former name, CPSD.

> The Commission institutes this formal proceeding to evaluate CPSD's Report and determine whether PG&E, and its officers, directors, and managers, violated any provisions of the California Public Utilities Code, Commission General Orders or decisions, or other applicable standards, laws, rules or regulations in connection with the San Bruno fire and explosion on September 9, 2010. This investigation will not be solely limited to the events that took place on September 9, 2010, but shall include all past operations, practices and other events or courses of conduct that could have led to or contributed to the San Bruno explosion and fire. We will specifically consider what monetary fines and other remedies are appropriate to ensure that a catastrophe of this type does not occur again.
> OII at 2-3.

The assigned Commissioner and assigned Administrative Law Judge (ALJ) issued a joint scoping memo[7] on March 13, 2012, stating the scope of the proceeding as follows:

> The main issue to be addressed in this investigation is whether PG&E, in connection with the San Bruno explosion and fire on September 9, 2010, violated any applicable California statute (including the Public Utilities Code); any order, resolution, general order or other directive or regulation of this Commission; or any other applicable requirements (including federal gas safety requirements) or industry safety standards. (Footnote omitted) Whether PG&E's actions after the incident comported with Rule 1.1 of the Commission's Rules of Practice and Procedure (Rules) and numerous Orders and Resolutions of this Commission [is] also at issue. (Footnote omitted.)
>
> As set forth in Section VI of the OII, the investigation will focus on PG&E's past actions and omissions to determine whether PG&E has violated laws requiring safe utility gas system practices. (Footnote omitted) The Commission may exercise its broad authority to

[7] *Assigned Commissioner and Administrative Law Judge's Joint Scoping Memo and Ruling and Notice of Hearing* (Scoping Memo) at 2-4.

> impose fines and other remedies if such violations are proven, (Footnote omitted) and the amount of such fines and the nature of such remedies are at issue.
>
> While the CPSD Report is the focus of the investigation, CPSD's investigation is ongoing. Thus, CPSD may bring assertions of additional violations to the Commission's attention in this docket or by commencement of a separate enforcement proceeding. (Footnote omitted) The Commission's remedial powers include not only its authority to impose civil penalties but also to order PG&E to change or improve its maintenance, operation, or construction standards for gas pipelines in order to ensure system-wide safety and reliability. (Footnote omitted) Thus, PG&E may be ordered to implement recommendations in the CPSD Report (including any addendum to the CPSD Report) to improve and ensure system-wide safety and reliability. (Footnote omitted.)
>
> In addition, the scope of this investigation includes PG&E's cooperation with discovery requests in this proceeding in the light of PG&E's obligation under Rule 1.1 to provide complete and non-misleading answers to the Commission and its staff. (Footnote omitted) Finally, the scope of the proceeding includes PG&E's compliance with Orders and Resolutions issued by the Commission to PG&E since the date of the San Bruno incident. (Footnote omitted.)
>
> No party at the [prehearing conference] raised any objection or concern with the OII's designation of the scope of issues to be considered. This Scoping Ruling incorporates and adopts the Preliminary Scoping Memo set forth in the OII as the Scoping Memo for the proceeding.

3.2. Related Actions and Proceedings

On September 13, 2010, the Commission's Executive Director ordered PG&E to reduce operating pressure in Line 132 to a level 20% below the pressure at the time of the explosion. On September 23, 2010 the Commission issued Resolution L-403, ordering PG&E to "review the classification of its natural gas transmission pipelines and determine if those classifications have changed since

the initial designation." Resolution L-403 also created the IRP to gather and review facts, and make recommendations to the Commission for the improvement of the safe management of PG&E's natural gas transmission lines.

The NTSB issued Urgent Safety Recommendations P-10-2 and P-10-3 on January 3, 2011. These NTSB recommendations were to determine "the valid maximum allowable operating pressure" for its natural gas transmission lines "in class 3 and class 4 locations that have not had a maximum allowable operating pressure established through prior hydrostatic testing" through a "traceable, verifiable, and complete" search of its "as-built drawings, alignment sheets, and specifications, and all design, construction, inspection, testing, maintenance, and other related records." In a letter to PG&E on the same date, the Commission's Executive Director ordered PG&E to comply with the recommendations by February 1, 2011. On January 13, 2011 the Commission issued Resolution L-410, ratifying Executive Director's order and extending the compliance report filing date to March 15, 2011.

The Commission instituted Investigation (I.) 11-02-016 (Recordkeeping OII) on February 24, 2011. I.11-02-016 is an investigation into whether PG&E violated applicable rules or requirements pertaining to safety recordkeeping for its gas service and facilities across its system, including Segment 180. Also on February 24, 2011, the Commission initiated a statewide rulemaking proceeding (Rulemaking (R.) 11-02-019) to consider a "new model of natural gas pipeline safety regulation applicable to all California pipelines."

On June 24, 2011, the revised "*Report of the Independent Review Panel – San Bruno Explosion*" (IRP Report) was issued. The IRP Report made many recommendations to PG&E as well as to the Commission to improve its gas safety regulations and oversight.

The NTSB Report, issued on August 30, 2011, found that the pipeline segment that ruptured was not properly manufactured or installed, safety standards were overlooked or ignored, PG&E's inspection and maintenance practices over time were deficient and ineffective, and that PG&E's response to the incident was excessively slow.

On November 10, 2011, the Commission launched a related investigation, I.11-11-009 (Class Location OII), to determine whether PG&E's natural gas transmission pipeline system was safely operated in areas of greater population density, which resulted from PG&E's compliance reports issued in response to Resolution L-403.

3.3. Fines and Remedies Issues

On September 7, 2012 CPSD filed a motion seeking permission to file a single coordinated brief regarding fines and remedies in this proceeding as well as I.11-02-016 and I.11-11-009. The assigned ALJs granted the motion by ruling dated September 25, 2012. Accordingly, fines and remedies issues will be addressed in a separate decision. This decision addresses violations alleged in I.12-01-007.

3.4. Parties

The OII named CPSD as a party and PG&E as respondent, and it invited the active participation of intervenors. The Division of Ratepayer Advocates (DRA),[8] the City and County of San Francisco (CCSF), and the City of San Bruno

[8] DRA was renamed the Office of Ratepayer Advocates (ORA) effective September 26, 2013, pursuant to Senate Bill 96 (Budget Act of 2013: public resources), which was approved by the Governor on September 26, 2013. However, for consistency and to avoid confusion, this decision refers to ORA by its former name, DRA.

(CSB) were granted party status at the February 14, 2012 prehearing conference. The Utility Reform Network (TURN) was granted party status by electronic ruling on February 15, 2012, affirmed in the Scoping Memo. All six parties have participated actively throughout the course of the proceeding.

3.5. Testimony and Witnesses

On March 16, 2012, CPSD served the testimony of Raffy Stepanian, which adopted the CPSD Report and supporting documents as his testimony. The CPSD Report referred to (among other things) the December 30, 2011 Overland Consulting (Overland) *Focused Audit of Pacific Gas and Electric Gas Transmission Pipeline Safety-Related Expenditures for the Period 1996-2010* (Overland Report).

CCSF served the testimony of John Gawronski on April 23, 2012. CSB served the testimony of Mayor Jim Ruane on April 23, 2012. TURN served the testimony of Marcel Hawiger on April 24, 2012.

PG&E served testimony responding to the written testimony from CPSD and the intervening parties on June 26, 2012. PG&E included the testimony of outside industry experts John Zurcher (integrity management), Robert Caligiuri, Ph.D. (root cause of the rupture), John Kiefner, (cyclic fatigue), Thomas Miesner (SCADA and Milpitas Terminal), David Bull (emergency plan compliance), Joseph Martinelli, (budgeting and spending), and Matthew O'Loughlin (PG&E's actual and imputed adopted O&M and capital expenditures). PG&E also submitted the testimony of company witnesses David Harrison (Line 132 and Segment 180 construction and recordkeeping), Kris Keas (integrity management), Mark Kazimirsky and Keith Slibsager (joint testimony regarding SCADA, Gas Control, and events and control systems at Milpitas Terminal), Kathy Oceguera (drug and alcohol testing), Jonathan Seager (Brentwood alternate Gas Control facility security camera), Benedict Almario (emergency response), Joel Dickson

(emergency response plans), and Jane Yura (post-San Bruno explosion and fire improvements).

On August 20, 2012, CPSD served the rebuttal testimony of Raffy Stepanian as well as the rebuttal testimony of Gary Harpster. Witness Harpster also sponsored the Overland Report.

3.6. Hearings

Prehearing conferences were held on February 14, 2012 and August 29, 2012. Evidentiary hearings commenced on September 24, 2012. Because of the relationship of this proceeding and the Recordkeeping and Class Location OIIs, and because several witnesses had served testimony in more than one of the proceedings, the assigned ALJs conducted several days of hearings on a joint record. The September 24, 2012 hearing was a joint hearing in this and the Class Location OII on the issue of PG&E's use of assumed Specified Maximum Yield Strength (SMYS) values. The remaining joint hearings covered this OII and the Recordkeeping OII.[9]

Upon motion by CPSD to suspend proceedings in order to facilitate negotiations towards a stipulated outcome in this proceeding and the Recordkeeping and Class Location OIIs, by joint ruling dated October 11, 2012 the ALJs suspended the proceedings until November 1, 2012. By joint ruling dated November 19, 2012, the assigned Commissioners in the three proceedings

[9] Transcript references herein are formatted as follows. References to the hearings in this proceeding only are designated by volume number and page number in the format "X Tr. y." References to the joint hearings are in the format "X Jt. Tr. y." The testimony of PG&E witness Keas in the Recordkeeping OII was incorporated into the record of this proceeding. 6 Jt. Tr. 623-25. Transcript references to that testimony are in the format "X RK Tr. Y."

granted in part a second motion by CPSD, on behalf of the active parties, for extension of time to facilitate negotiations towards a stipulated outcome. The assigned Commissioners notified parties that in the absence of an agreement in principle to settle, evidentiary hearings would resume.

Hearings resumed on January 8, 2013 and were concluded with respect to alleged violations on January 17, 2013. In all, evidentiary hearings on violations for this proceeding only were held on nine days and joint evidentiary hearings on violations were held on nine days. In addition, hearings to address administrative issues, status conferences, oral argument, and law and motion matters pertaining to violations were held on six days.

3.7. Briefs

Each of the parties in this proceeding filed opening briefs on alleged violations on March 11, 2013 and reply briefs on April 25, 2013. Concurrently with its opening brief, PG&E filed a request for official notice of certain documents from the Recordkeeping OII. By electronic ruling issued on March 27, 2013, confirmed in a written ruling filed on May 2, 2013, PG&E's request was denied except with respect to one document—the 1955 ASME B31.8 industry standards. PG&E was ordered to re-file its opening brief to remove references to portions of the record of other proceedings where the ALJ had denied PG&E's request for official notice. PG&E re-filed its opening brief on April 3, 2013.

As more fully detailed in Section 4.5 below, in response to a request of the ALJ, CPSD included with its opening brief an appendix (Appendix C) listing the violations alleged by CPSD. On April 18, 2013 CPSD filed a revision to Appendix C in response to rulings by the ALJ.

3.8. Positions of the Parties

CPSD alleges that PG&E has committed 55 violations of Section 451, 49 CFR 192, and/or 49 CFR 199. CPSD's alleged violations fall into five categories: (1) PG&E's fabrication and construction of Segment 180 of Line 132 (13 violations), (2) PG&E's Integrity Management Program (15 violations), (3) PG&E's SCADA System and the Milpitas Terminal (5 violations), (4) PG&E's Emergency Response (21 violations), and (5) PG&E's Safety Culture (1 violation). CPSD originally alleged a sixth category of violations: PG&E's recordkeeping practices with regard to Line 132 and Segment 180. To avoid overlap, CPSD deferred to the Recordkeeping OII (I.11-02-016) as the proper venue to allege those violations. Of the 55 violations alleged by CPSD, 37 are alleged to be ongoing violations, continuing for decades in some cases, and 18 are alleged as one-time occurrences. CCSF, CSB, DRA, and TURN generally concur with, and in some cases provided analytical and evidentiary support for, CPSD's allegations of violations.

CCSF alleges that PG&E committed violations pertaining to the integrity management program, PG&E's emergency response, and its safety culture.

CSB contends that PG&E's emergency response and public awareness activities violated numerous federal and state laws. CSB also contends PG&E's singular focus on financial performance was in violation of Section 451. Further, CSB contends that the Commission's investigation process is fundamentally flawed and that the Commission failed in its obligation to oversee PG&E's operation of its highly dangerous system.[10]

[10] To the extent that they are pertinent to the determination of fines and other remedies, the concerns of CSB and others about the quality and effectiveness of this Commission's

Footnote continued on next page

DRA believes the Commission should hold PG&E accountable for the violations it has committed since 1956. DRA seeks the adoption of findings and conclusions regarding errors and omissions by PG&E that would lead to ratemaking disallowances for testing and replacement expenses for PG&E's gas transmission system. DRA also seek the adoption of a process to ensure that an independent third party monitor is appointed to oversee PG&E's testing, replacement, and recordkeeping activities. DRA's recommendations regarding remedies will be addressed in a separate decision.

TURN, in addition to supporting CPSD's allegations, alleges that PG&E committed violations by spiking the pressure on multiple pipelines and failing to properly assess them under integrity management requirements. TURN also alleges that PG&E may have violated federal regulations by relying on external corrosion direct assessment (ECDA) to assess the majority of pipelines with identified manufacturing threats. TURN proposes ratemaking disallowances for imprudent actions by PG&E to the extent that violations are not proven; this recommendation will be addressed in the fines and remedies decision.

While acknowledging responsibility for the San Bruno explosion and fire, PG&E contends that CPSD has not proven the vast majority of the violations that it has asserted against PG&E. PG&E admits only that it violated 49 CFR 192.13(c) in its clearance procedure and 49 CFR 199.225 in its alcohol testing. PG&E also takes issue with CPSD's allegations of continuing violations.

---

safety oversight of California's natural gas pipeline operators will be addressed in the fines and remedies decision.

3.9. Extension Orders

Section 1701.2(d) provides that adjudicatory cases shall be resolved within 12 months of the date they are initiated unless the Commission makes findings as to why that deadline cannot be met and issues an order extending that deadline. This proceeding was initiated on January 12, 2012. Decision (D.) 12-09-031 found an extension was necessary and ordered an extension of the 12-month statutory deadline to January 12, 2014. D.13-10-056 further extended the deadline to January 12, 2015.

4. Legal and Other Issues of General Applicability

4.1. Root Cause of the San Bruno Explosion and Fire

The NTSB Report determined that the probable cause of the San Bruno disaster was PG&E's (1) inadequate quality assurance and quality control in 1956 during its Line 132 relocation project, which allowed the installation of a substandard and poorly welded pipe section with a visible seam weld flaw that, over time grew to a critical size, causing Line 132 to rupture during a pressure increase stemming from PG&E's poor performance of planned electrical work at the Milpitas Terminal; and (2) an inadequate pipeline integrity management program, which failed to detect and repair or remove the defective pipe section. The NTSB report documents other contributing factors as well.

CPSD contends that there were several root causes, including PG&E's failure to follow accepted industry practice when constructing the section of pipe that failed, PG&E's failure to comply with integrity management requirements, PG&E's inadequate recordkeeping practices, SCADA system deficiencies and inadequate procedures to handle emergencies and abnormal conditions, PG&E's deficient emergency response actions after the incident, and a systemic failure of PG&E's corporate culture to emphasize safety over profits.

According to PG&E, the rupture was caused by an initial defect in one of the Segment 180 pups, a ductile tear, and fatigue crack growth.

The caption title for this proceeding indicates it is an investigation into PG&E's operations and practices to determine violations of Section 451, GO 112, and other applicable laws "in [c]onnection with the San Bruno [e]xplosion and [f]ire." Similarly, the Scoping Memo provided that "[t]he main issue to be addressed in this investigation is whether PG&E, in connection with the San Bruno explosion and fire on September 9, 2010, violated any applicable California statute (including the Public Utilities Code); any order, resolution, general order or other directive or regulation of this Commission; or any other applicable requirements (including federal gas safety requirements) or industry safety standards." Scoping Memo at 2.

Although this proceeding is an investigation into alleged violations connected with the San Bruno explosion and fire, it is not focused solely on, nor is it dependent upon, determining the root cause of the disaster. Rather, it is focused on determining (1) whether PG&E violated gas safety laws and (2) appropriate fines and other remedies for violations that are found to have occurred. Moreover, it is not restricted to violations for conditions, practices, operations, acts, or omissions that are proven to have caused, or proven to have contributed to causing, the explosion and fire. As CPSD stated in its rebuttal testimony:

> There is no requirement that a violation must be the root cause of an accident in order for it to be considered a violation. A "failure to comply with a GO is a violation of that GO." (D.04-04-065.) CPSD does not have to prove that every violation is the "root cause" of the explosion. Exhibit CPSD-5 at 4.

4.2. Section 451

4.2.1. Introduction

Section 451 provides that:

> All charges demanded or received by any public utility, or by any two or more public utilities, for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable. Every unjust or unreasonable charge demanded or received for such product or commodity or service is unlawful.
>
> Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities … as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public.
>
> All rules made by public utility affecting or pertaining to its charges or service to the public shall be just and reasonable.

Originally titled Section 13 and re-codified as Section 451 in the early 1950's, the statute has been in effect since 1909.

The applicability of Section 451, and in particular the second paragraph, is a threshold issue in this proceeding. CPSD argues that, half a century prior to the 1956 installation of Segment 180, Section 451 created an obligation for PG&E to follow good utility safety practices, and that any unsafe condition or violation of a utility safety practice may be a violation of Section 451. Of the 55 separate violations that CPSD alleges in this proceeding, 20 invoke Section 451. CPSD contends that PG&E created an unreasonably unsafe system in violation of Section 451 by failing to follow industry standards during the construction of Segment 180 in 1956. CPSD further contends that PG&E's budget cutting on gas transmission safety in the years prior to the San Bruno explosion September 9, 2010 constituted a continuing violation of Section 451.

PG&E contests CPSD's reliance on Section 451 to allege violations, arguing that Section 451 is not a free-floating source of pipeline safety requirements. If Section 451 mandates good utility safety practices, then other code sections and regulations are superfluous, according to PG&E. PG&E also raises a due process issue, arguing that CPSD cannot show that the Commission ever put PG&E on notice that Section 451 created a requirement to comply with good utility safety practices.

4.2.2. Statutory Construction

In support of the argument that Section 451 is a ratemaking provision that cannot serve as a "free-floating" source of pipeline safety requirements, PG&E first notes that Section 451 appears in Chapter 3, Article 1 of the Public Utilities Act under the heading "Rates" and that all the substantive provisions of that article address ratemaking. In contrast, PG&E observes, Chapter 4 of the Act, entitled "Regulation of Public Utilities," contains statutory provisions that confer authority on the Commission to promulgate and enforce safety standards.

PG&E points to rules of statutory construction, arguing that a code section must be construed "'in the context of the statute as a whole and the overall statutory scheme.'" *Smith v. Superior Court*, 39 Cal. 4th 77, 83 (2006) (quoting *People v. Canty*, 32 Cal. 4th 1266, 1276 (2004)). PG&E also notes that "it is well established that 'chapter and section headings [of an act] may properly be considered in determining legislative intent . . . and are entitled to considerable weight.'" *People v. Hull*, 1 Cal. 4th 266, 272 (1991) (quoting *Am. Fed'n of Teachers v. Bd. of Educ.*, 107 Cal.App. 3d 829, 836 (1980)). PG&E thus argues that the statutory structure, reflected in its headings, weighs "considerabl[y]" against interpreting Section 451 as a free-floating safety standard. *Hull*, 1 Cal. 4th at 272.

PG&E also observes that Section 451's only reference to safety appears in one dependent clause within a multi-paragraph provision and that the first paragraph mandates that a utility charge just and reasonable rates. As framed by PG&E, the second paragraph specifies what level of service a utility must furnish in exchange for receiving just and reasonable rates: it must furnish adequate, efficient, just and reasonable service, of which "safety" is just one element.[11]

PG&E's "statutory scheme" argument is not persuasive. While it is true that Chapter 4 of the Public Utilities Act is entitled "Regulation of Public Utilities," PG&E fails to point out that Chapter 3, where Section 451 resides, is entitled "Rights and Obligations of Public Utilities." It is entirely consistent with the Legislature's statutory scheme to find a utility safety obligation in Chapter 3 of the Public Utilities Act.

PG&E also argues that Section 451 is not a source of safety requirements because Article 1 of Chapter 3 is entitled "Rates" and the first paragraph of the statute addresses rates. But even under the construct described by PG&E, i.e., that Section 451 provides for a balancing of rates and other considerations that include safety, there is nothing to suggest that safety is not an absolute duty under Section 451. The fact that the safety obligation appears in an article entitled "Rates" does not diminish the significance of that obligation.

---

[11] PG&E's framing of Section 451 as a balancing of rates and service does not portray a complete picture. In *Pacific Bell Wireless (Cingular) v. PUC* (2006) 140 Cal.App. 4th 718, the court upheld the Commission's imposition of a fine on a wireless carrier under Section 451 even though the court found that the Commission was preempted by federal law from regulating *rates* of wireless carriers. In other words, the court held that the Commission may find violations under the second paragraph of Section 451 even where the first paragraph is inapplicable and no balancing of rates and service is at issue. *Pacific Bell Wireless (Cingular) v. PUC* 140 Cal.App. 4th at 723.

Finally, we note that PG&E's efforts to apply rules of statutory construction in its efforts to characterize Section 451 as a ratemaking-only statute are misplaced. Where statutory language is clear and unambiguous, there is no need for judicial construction. *California School Employees Assn. v. Governing Board* (1994) 8 Cal. 4th 333, 340; *Ladd v. County of San Mateo* (1996) 12 Cal. 4th 913, 921; *California Fed. Savings & Loan Assn. v. City of Los Angeles* (1995) 11 Cal. 4th 342, 349. The text of Section 451 is unambiguous—it simply, clearly, and without qualification requires all public utilities to provide and maintain "adequate, efficient, just, and reasonable" service and facilities as are necessary for the "safety, health, comfort, and convenience" of its customers and the public.

4.2.3. Nature of the Section 451 Safety Obligation

CPSD asserts that Section 451 is a broad and general requirement for utilities to create and follow safe operating practices. PG&E sees the nature of the Section 451 safety obligation differently, arguing that in its scheme of balancing of rates and other considerations, safety is just one of many concerns. Thus, PG&E argues, Section 451 cannot be a stand-alone, free-floating safety rule because the Commission would have to extract one consideration—safety—from all the Section 451 considerations in setting rates. PG&E believes that such a construction fails to read Section 451 as a whole and in context.

PG&E is, in effect, suggesting that any safety obligation created by Section 451 is recalibrated each time the Commission considers the setting of rates. That proposition is unsupported and it is a distortion of the regulatory compact that PG&E finds in Section 451. Contrary to PG&E's argument, the safety obligation established by Section 451 is not a residual, variable byproduct of a particular rate level set by the Commission. To be clear, public utilities are

not permitted to adopt anything other than safe operations and practices, even if they believe that rates approved by the Commission are inadequate.

PG&E also takes the position that if Section 451 mandates good utility safety practices, then other code sections and regulations dealing with gas pipeline safety are superfluous, citing *Klein v. United States*, 50 Cal. 4th 68, 80 (2010) (describing the rule of statutory construction that "courts must strive to give meaning to every word in a statute and to avoid constructions that render words, phrases, or clauses superfluous."). PG&E then argues that the Legislature would have spoken with a great deal more clarity had it intended to impose a "good utility safety practices" standard on every public utility in the state, distinct from the Commission's explicit safety rulemaking authority and the rules promulgated thereunder. For this proposition, PG&E cites a U.S. Supreme Court holding that Congress "does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions – it does not, one might say, hide elephants in mouseholes." *Whitman v. American Trucking Assoc., Inc.*, 531 U.S. 457, 468 (2001).

We find no redundancy or superfluity in the co-existence of the general, overarching safety obligation established by Section 451 and specific safety requirements such as those set forth in GO 112 and Title 49 of the CFR. In 1960, when the Commission adopted GO 112, it recognized that utilities had a pre-existing and continuing responsibility to the public to provide safe service; and that the responsibility goes beyond GO 112 because no code of safety rules can cover every conceivable situation:

> 7. Public utilities serving or transmitting gas bear a great responsibility to the public respecting the safety of their facilities and operating practices.

> 8. It is recognized that no code of safety rules, no matter how carefully and well prepared can be relied upon to guarantee complete freedom from accidents. Moreover, the promulgation of precautionary safety rules does not remove or minimize the primary obligation and responsibility of respondents to provide safe service and facilities in their gas operations. Officers and employees of the respondents must continue to be ever conscious of the importance of safe operating practices and facilities and of their obligation to the public in that respect. Decision 61269 (1960); 58 CPUC 413, 420.

Moreover, as TURN points out, GO 112 itself made clear that Section 451 continued to apply separately and independently of the new rules by specifying in Section 104.4 that "[c]ompliance with these rules is not intended to relieve a utility from any statutory requirement." The Commission clearly intended that the new rules would be complementary to the utilities' primary safety obligation and not redundant.

We note that the complementary relationship between Section 451 and other, specific gas pipeline safety requirements has some parallels with the relationship between California's basic speed law[12] and other, specific speed laws. Just as California motorists must simultaneously observe both the basic speed law and other speed limits that may be in effect, California gas corporations must observe a basic safety law—Section 451—and specific gas pipeline safety rules and regulations such as GO 112 and Title 49 CFR. The basic speed law does not render other speed limits superfluous, and Section 451 does not render other pipeline safety rules superfluous.

---

[12] California Vehicle Code Section 22350 states: "No person shall drive a vehicle upon a highway at a speed greater than is reasonable or prudent having due regard for weather, visibility, the traffic on, and the surface and width of, the highway, and in no event at a speed which endangers the safety of persons or property."

The Commission has addressed the relationship between a utility's safety obligation and specific safety regulations as follows:

> We require our natural gas transmission system operators to exercise initiative and responsible safety engineering in all aspects of pipeline management. Simply because a regulation would not prohibit particular conduct does not excuse a natural gas system operator from recognizing that such conduct is not appropriate or safe under certain circumstances. D.12-12-030 at 95.

Finally, we find PG&E's reliance on *Whitman v. American Trucking Assoc., Inc.*, 531 U.S. 457, inapt. As we found earlier, there is nothing ambiguous or vague in the terms of Section 451 that establish a utility safety obligation. The second paragraph of Section 451 is not ancillary.

4.2.4. Precedent for Applicability of Section 451

When it instituted this investigation, the Commission noted that Section 451 requires all public utilities to provide safe service and that "the California Court of Appeals has upheld the Commission's authority to find Section 451 violations that are separate and distinct from any other rule or regulation," citing *Pacific Bell Wireless (Cingular) v. PUC* (2006) 140 Cal.App. 4th 718. OII at 7.

In support of its reliance on Section 451, and its position that any unsafe condition or a violation of a utility safety practice may be a violation of Section 451, CPSD notes that in *Cingular*, the Court quoted with approval the Commission's decision in *Carey v. Pacific Gas & Electric Company* (1999) D.99-04-029, 85 Cal. PUC 2d 682, 689:

> [I]t would be virtually impossible to draft Section 451 to specifically set forth every conceivable service, instrumentality and facility which might be "reasonable" and necessary to promote the public safety. That the terms are incapable of precise definition given the variety of circumstances likewise does not make section 451 void for

> vagueness, either on its face or in application to the instant case. The terms "reasonable service, instrumentalities, equipment and facilities" are not without a definition, standard or common understanding among utilities. *Pacific Bell Wireless (Cingular) v. PUC*, 140 Cal.App. 4th at 741, n 10.

CPSD goes on to note that in *Cingular*, the Court rejected an argument "that there *must* be another statute or rule or order of the Commission that has been violated for the Commission to determine there has been a punishable violation of section 451." *Pacific Bell Wireless (Cingular) v. PUC*, 140 Cal.App. 4th at 743. In support thereof, the Court relied upon *Carey v. Pacific Gas & Electric Company*, *supra*, 85 Cal. PUC 2d 682, 683, stating that "the Commission fined the public utility for violating Section 451 (without finding a violation of any other specific statute) by failing to "'furnish and maintain such adequate, efficient, just and reasonable service, instrumentalities, equipment and facilities' when the utility permitted fumigators to turn off gas service to buildings before tenting them." *Pacific Bell Wireless (Cingular) v. PUC*, 140 Cal.App. 4th at 743. Accordingly, CPSD maintains, PG&E cannot claim that Section 451 does not create a duty separate from GO 112 for PG&E to provide safe service.

PG&E counters that *Carey* does not support CPSD's reliance on Section 451 in this proceeding. PG&E reasons that in *Carey*, unlike here, the Commission could hold PG&E to the "reasonable service, instrumentalities, equipment and facilities" standard of Section 451 because those terms were not without definition and the Commission was able to conclude that PG&E had fair notice of what was reasonable. Reasonableness could be determined with reference to "a definition, standard, or common understanding among utilities." *Carey v. Pacific Gas & Electric Company* (1999) 85 Cal. PUC 2d 682, 689, (citing *Chodur v. Edmonds*, 174 Cal.App. [3d] 565 ([1985]) (the term "dishonest dealing" was not

unconstitutionally vague because it could be determined with reference to a common understanding)). However, the issues raised by PG&E in *Carey* and here are the same:

> PG&E contends that the language in Section 451 is too general to support the imposition of the fine under Section 2107. PG&E argues that Section 451's mandate that a utility provide "reasonable service" to promote public safety is vague. More specifically, PG&E argues that Section 451 fails to identify what utility action or inaction is "reasonable." For the same reasons, PG&E contends that Section 451 is unconstitutionally vague. (*Carey v. Pacific Gas & Electric Company*, D.99-04-029 (1999) 85 Cal. PUC 2d 682, at 687.)

Notwithstanding PG&E's argument in the *Carey* proceeding, the Commission found that "Section 451's mandate that a utility provide 'reasonable service, instrumentalities, equipment and facilities' as necessary to promote the public safety is constitutional and not violative of due process." *Id*. at 689.

In this proceeding CPSD does not hold PG&E to a "free-floating" safety standard; rather, as discussed below, it relies on industry standards and the expert opinions of its expert engineers. PG&E cannot argue that it is being held to a standard of reasonableness that is determined without reference to "a definition, standard, or common understanding among utilities." PG&E has provided no basis for our reaching a different conclusion here than the Commission did in *Carey*.

PG&E next argues that *Cingular* does not support CPSD's reliance on Section 451, asserting that it had nothing to do with safety. It involved a fine imposed by the Commission against a wireless telephone service provider for unjust and unreasonable practices relating to an early termination fee and the failure to disclose network problems that misled consumers about the available coverage and service. PG&E asserts that the Commission has never applied

Section 451 to punish a utility in a safety enforcement proceeding for "general across-the-board shoddy gas operations." PG&E Opening Brief at 34. PG&E acknowledges that several Commission decisions have cited Section 451 in approving settlements in safety enforcement proceedings. For example, PG&E cites *Investigation re PG&E Mission Substation Fire and Electric Outage Pursuant to Public Utilities Code Section 451*, D.06-02-003 (2006).

PG&E correctly notes that under Rule 12.5 of the Commission's Rules of Practice and Procedure (Rules), the general rule is that settlements have no precedential value.[13] However, PG&E does not explain why a succession of settled safety enforcement cases, even if without precedential value, would not have placed it on notice that the Commission consistently applies Section 451 in such cases, even to the point of regularly and explicitly citing the statute in Commission *orders* instituting investigation in safety enforcement proceedings. Moreover, *Carey* was a safety case that relied solely on Section 451 and was not settled.

Furthermore, as DRA explains at length, there were many factors in addition to the 1960 order adopting GO 112 and the *Carey* decision that put

[13] In *Investigation into the Operations and Practices of Pacific Gas and Electric Company Regarding the Gas Explosion and Fire on December 24, 2008 in Rancho Cordova, California,* D.11-11-001 (2011), the Commission approved two stipulations that the Commission considered as settlements under Rules 12.1 to 12.7. Rule 12.5 provides that adoption of a settlement does not constitute precedent regarding any principle or issue unless the Commission expressly provides otherwise. In *Rancho Cordova*, the Commission expressly stated as a conclusion of law the following: "[a] basic principle of public utility service is for the public utility to provide safe and reliable service, and PG&E is required to provide such service pursuant to Pub. Util Code §451." D.11-11-001 at 47. More recently, in D.13-09-028, resolving a safety enforcement proceeding, the Commission noted that "[t]he edicts of §451 are a cornerstone of today's decision." D.13-09-028 at 16.

PG&E on notice that its practices were unsafe and that it could be fined under Section 451 for those unsafe practices (although those two decisions alone would be sufficient to establish that PG&E has been on notice for decades that it may be fined for general safety violations pursuant to Section 451). In 1981, the NTSB investigated a gas pipeline leak in San Francisco where PG&E took 9 hours and 10 minutes to stop the flow of gas because it could not locate one emergency valve due to inaccurate records. Bechtel advised PG&E in 1986 of the risk to its integrity management program caused by missing pipeline data, and the need for additional research to resolve these "uncertainties." The NTSB reports on the incidents in San Francisco in 1981 and the 2008 Rancho Cordova gas explosion both put PG&E on notice that many of its practices were deficient, unsafe, and needed to be modified. A 2009 PG&E-commissioned audit of its integrity management risk algorithm put PG&E on notice that its risk assessment methodology suffered from "significant weaknesses" causing the safety of its system to be compromised. In 2005 the Commission opened an investigation against PG&E based solely on electrical safety violations under Section 451, stating that "Section 451 requires a public utility to maintain its equipment and facilities in a safe and reliable manner. We hereby place PG&E on notice and provide an opportunity for PG&E to be heard on the issue of whether it violated section 451, and whether penalties should be imposed." I.05-03-011 at 10. The Commission applied Section 451 as a stand-alone safety statute and found Southern Pacific violated Section 451 for "failing to assist" in "promptly developing mitigation measures" for chemicals that the railroad utility dumped into the Sacramento River. D.94-12-001, Conclusion of Law 17. In sum, the Commission has applied Section 451 as a stand-alone safety statute on at least three occasions, two involving PG&E, and it put PG&E and other gas utilities on

notice when it adopted General Order 112 that they were still liable for their "primary obligation and responsibility . . . to provide safe service and facilities in their gas operations." Decision 61269; 58 CPUC 413, 420. PG&E has been on notice for several decades that its operation and maintenance of its gas transmission system was potentially unsafe.

In any event, the suggestion that the Commission has never applied Section 451 in a *safety* enforcement proceeding as opposed to other types of enforcement proceedings, even if it were true, would be of no consequence. For PG&E's argument that it has not been notified that it must always maintain safe practices pursuant to Section 451 to prevail, it would have to show why the cases upholding the applicability of Section 451 in enforcement proceedings would apply to "health, comfort, and convenience" but not to safety.[14] It has failed to do so. In short, PG&E's efforts to show that *Carey* and *Cingular* do not support CPSD's reliance on Section 451 in this proceeding cannot be upheld

4.2.5. Alleged Vagueness and Lack of Notice

PG&E claims that Section 451 is too vague to form the basis of violations and that it did not have notice that its gas transmissions system operations and practices might run afoul of Section 451 based on how CPSD chooses to define violations. PG&E contends that this constitutes a due process violation because it allows Section 451 to be "free-floating" and to be interpreted as CPSD wants.

PG&E's "free-floating" complaint might be valid if CPSD alleged violations under Section 451 in an arbitrary or capricious manner. However, CPSD's engineers are qualified, licensed, expert engineers, qualified to form

[14] As CSB notes, "the Line 132 Explosion was neither healthy, nor comfortable, nor convenient for the residents of the Crestmoor neighborhood." CSB Reply Brief at 21.

expert opinions about pipeline safety. CPSD also hired professional, independent consulting engineers to assist in the preparation of its testimony, and providing expert opinions is one aspect of their jobs. It is appropriate for CPSD's engineers to have opinions about what constitutes a safe practice. Additionally, CPSD's expert opinions with regards to safety are not "free-floating" or arbitrary but are grounded in the standards of safe gas pipeline construction that were in effect in the 1950s. As explained in CPSD's testimony:

> Section 451, which has been in effect since 1909 (half a century prior to the installation of Segment 180), is a broad and general requirement for utilities to create and follow safe operating practices. Section 451 is not prescriptive in the specific manner in which its obligations must be met. Without such specifics and because no set of regulations can cover every single possible unsafe condition, one looks to the industry standards and guidelines for guidance. Exhibit CPSD-5 at 1.

CPSD maintains that each of its allegations of a Section 451 violation is grounded in an industry standard and that it does not impose an arbitrary standard on PG&E. For example, CPSD alleges that PG&E's failure to weld the pups all the way through violates industry standards set forth by the ASME, Gas Transmission and Distribution Piping Systems, B-31.1.18-1955, Section 811.27E, and the American Petroleum Institute's (API) Standard for Field Welding of Pipe Lines, Std. 1104, 4th Ed., 1956, Section 1.7. CPSD acknowledges it is conceivable that there could be a situation where the application of Section 451 is overly vague but contends that is not the case here.

Where it is shown that CPSD's alleged Section 451 violations are grounded in the opinions of qualified experts and/or industry standards such as the ASME and API standards, PG&E cannot reasonably assert that it is being subjected to

arbitrary or "free-floating" standards, and there is no "vagueness" problem in the way in which CPSD applies Section 451.

4.2.6. Conclusion: Section 451 Creates a Safety Obligation

In 1960, when it adopted rules for gas pipeline safety (GO 112), the Commission observed that there was a preexisting, ongoing, and overriding obligation and responsibility of gas utilities and their officers and employees to provide safe service, holding that:

- Public utilities serving or transmitting gas bear a great responsibility to the public respecting the safety of their facilities and operating practices;
- The promulgation of precautionary safety rules does not remove or minimize the primary obligation and responsibility of [gas utilities] to provide safe service and facilities in their gas operations; and
- Officers and employees of the [gas utilities] must continue to be ever conscious of the importance of safe operating practices and facilities and of their obligation to the public in that respect. Decision 61269 (1960); 58 CPUC 413, 420.

These overarching principles of utility safety responsibility are fully consistent with the view of Section 451 advocated by CPSD and the intervenors. Both the plain meaning of the language of Section 451 and well-established precedent uphold CPSD's reliance on the statute to allege violations. PG&E has been on notice since 1909, as affirmed in the 1960 decision adopting GO 112, that it must at all times maintain safe facilities and operations. Prior to 1960, industry safety standards provided a basis for PG&E to determine safe operations, and if it contravened such standards, it did so at risk of violating Section 451.

When PG&E constructed Line 132 in the 1940's, when it relocated a portion of that line in 1956, and in operating and maintaining the facilities in the

following decades, it was always fully obligated to "furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities … as are necessary to promote the safety … of its patrons, employees, and the public. Any failure to do so was a violation of the Public Utilities Code.

4.3. Burden and Standard of Proof

4.3.1. Introduction

CPSD has the burden of proof that PG&E committed the violations that it alleges, a proposition that no party opposes. Similarly, intervenors have the burden of proving the violations they allege.[15] Additionally, no party takes issue with the proposition that the Commission's usual practice is to apply the "preponderance of evidence" standard in enforcement proceedings.[16] CPSD states that "[i]n every adjudicatory case before the Commission, it has applied the "preponderance" standard. (See, *e.g.*, D.12-02-032; D.06-11-041; D.05-07-010; D.05-06-033; D.04-12-058; D.03-01-087; D.01-04-035.)" CPSD Reply Brief at 11. As the Commission recently stated in *Investigation re TracFone*, CPSD in that case had the burden of establishing by a preponderance of the evidence that TracFone had committed the alleged violations, and "[t]his is the usual practice in Commission adjudicatory proceedings, including investigations." D.12-02-032 at 4.

---

[15] Section 4.6 below addresses PG&E's contention that intervenors are not authorized to allege violations in this proceeding.

[16] The preponderance of the evidence standard "simply requires the trier of fact 'to believe that the existence of a fact is more probable than its nonexistence.'" *In re Angelica P.* (1981) 28 Cal. 3d 908, 918. Thus, under this standard, CPSD must simply demonstrate that it is more probable than not that PG&E committed the relevant violations.

4.3.2. PG&E's Proposed Exception

PG&E acknowledges that "preponderance" is the usual standard but argues that the Commission should apply the higher "clear and convincing" standard here due to the "scope of the proceeding, the broad sanctions the Commission has stated it may impose, … the lack of rigor in the applied legal standards and violations," and the "high-stakes" nature of this proceeding. PG&E Opening Brief at 24. PG&E cites two professional license suspension cases where the California courts have applied the clear and convincing standard: *Hughes v. Bd. Of Architectural Examiners*, 17 Cal. 4th 763 (1998) and *Grubb v. Department of Real Estate*, 194 Cal.App. 4th 1494 (2011). PG&E maintains these license suspension cases parallel this proceeding not only because of their high-stakes aspect but also because the possible remedies here include not only substantial monetary penalties but also significant non-monetary sanctions. Finally, while acknowledging that the Commission in *Investigation re Qwest Communications Corporation*, D.03-01-087, rejected the argument that clear and convincing evidence is required in enforcement proceedings involving potentially substantial penalties, PG&E argues that the Commission's reasoning in *Qwest* actually supports its position here.

It "is well settled that the standard of proof in Commission investigation proceedings is by a preponderance of the evidence." *Investigation re Communication Telesystems International*, D.97-05-089, 72 CPUC 2d 621, 633.[17] PG&E does not adequately explain why the scope of this proceeding, its

[17] D.97-05-089 was the subject of an application for rehearing that was resolved by D.97-10-063, 76 CPUC2d 214. The former decision's holding on standard of proof was not disturbed.

potential for broad sanctions, any lack of rigor (which it also fails to demonstrate) or its obvious high-stakes nature should prompt us to carve out an exception to the well-established principle that preponderance of evidence is the standard applied in our adjudicatory enforcement proceedings. The stakes are high because CPSD discovered evidence leading it to allege numerous violations, many of them continuing. PG&E is not entitled to have CPSD held to a higher burden of proof because it allegedly committed numerous and continuing violations.

We also find PG&E's reliance on *Hughes* and *Grubb* is without merit. The *Hughes* court held: "A licensee, having obtained such a fundamental vested right, is entitled to certain procedural protections greater than those accorded an applicant." According to this case, a license, once obtained, affords the licensee a "fundamental vested right" to ply his or her trade. *Hughes* 17 Cal. 4th at 789 (1998). As CPSD notes, however, PG&E has no right to avoid statutory penalties that is fundamentally vested, thus the case is inapposite here. Similarly, *Grubb v. Department of Real Estate*, 194 Cal.App. 4th 1494 (2011) is a professional license case and does not involve administrative fines. In these license cases the courts were concerned with taking away a person's livelihood. PG&E, however, is not being threatened with having its license revoked.

In *Qwest*, the Commission rejected an analogy between the statutory penalties authorized by Section 2107 and punitive damages, which by statute require "clear and convincing evidence of oppression, fraud, or malice." D.03-01-087 at 8. The Commission concluded that the higher evidentiary standard for punitive damages was unwarranted because Section 2107 penalties are determined within a range and capped by the Legislature, whereas punitive damages are determined by a fact finder (judge or jury). *Id*. PG&E contends

that, unlike in *Qwest* where the total fine was driven by a large number of violations, the alleged continuing violations in this proceeding could lead to Commission discretion far beyond the statutory range that would apply to a single violation that occurred on a single day. This, PG&E argues, could effectively negate Section 2107's penalty cap, leaving the Commission with as much discretion as a jury would have to return a large punitive damages award.

Under Section 2108, each day's continuance of a continuing violation is a separate and distinct offense. Thus, where an ongoing violation of many years is proven to have occurred, a large number of offenses will have occurred. However, with respect to any particular offense, the Commission has no more discretion here than it did in *Qwest*. The statutory range and cap in Section 2107 are the same. The reason the fines are potentially large here is that the alleged violations, to the extent proven, continued for decades unremediated by PG&E. PG&E itself will have been solely to blame for allowing dangerous conditions to exist and continue unabated, and PG&E will have been solely responsible for the length of time such violations continued. It would not be logical or fair to make it more difficult to prove violations against PG&E for the sole reason that PG&E allowed the violations to continue for decades. PG&E's attempt to recast *Qwest* as supportive of its position therefore lacks merit.

Finally, we note that the Commission has declined to apply the clear and convincing standard even in cases where license revocation was at issue. For example, in D.05-08-033, the Commission revoked Globe Van Lines' license to operate as a household goods carrier, and in doing so applied the preponderance standard. D.05-08-033 at 10. Also, in a case involving North Shuttle Service, a passenger stage corporation and charter-party carrier, one of the requested remedies was possible revocation of North Shuttle's operating authority, and the

Commission applied the preponderance of the evidence standard. D.98-05-019, 80 CPUC 2d 223, 232-233. PG&E's arguments for application of the clear and convincing standard of proof are not persuasive and are therefore rejected.

4.3.3. TURN's Positions

TURN argues that PG&E has the burden of proof as to its defenses, consistent with the general rule that a party has the burden of proof as to each fact the existence or nonexistence of which is essential to the claim for relief or defense the party is asserting. However, PG&E responds that it offered no affirmative defense (other than laches; see Section 4.8 below) and, therefore, that it has no burden of proof in this proceeding. Instead, as PG&E argues, it defended itself by rebutting the evidence and allegations of CPSD and intervenors. We concur with PG&E in this respect.

TURN goes on to argue that because ratemaking adjustments may be ordered in the fines and remedies phase of this proceeding,[18] PG&E has the burden to prove that its actions were prudent. While ratemaking adjustments are within the scope of remedies that may be ordered in this proceeding, this is an enforcement proceeding focused primarily on determining whether PG&E violated gas pipeline safety laws. To the extent that CPSD or intervenors prove that PG&E's actions were imprudent, such imprudence may be considered in the fines and remedies phase. However, even though TURN is correct that utilities bear the burden of proof as to prudence and are not entitled to any presumption of prudence in ratemaking cases, PG&E was not required to, or notified that it

[18] D.12-12-030 approved revenue requirement increases for PG&E's Pipeline Safety Enhancement Plan and ordered that the increases be subject to refund pending further order in this proceeding.

should, pursue this as a ratemaking case and sustain the burden of proving its actions were prudent for ratemaking purposes.

4.3.4. CCSF's Position

CCSF contends that where PG&E did not rebut evidence of other parties with the burden of proof, it cannot simply "hide" behind the burden of proof as a substitute for offering germane evidence on an issue. Thus, CCSF argues, the Commission can rely on the testimony of CCSF witness Gawronski since PG&E generally did not rebut it (except for one specific issue) and it did not cross examine the witness. PG&E counters that uncontroverted evidence is not automatically deemed correct, and we concur. "[E]xpert opinions, even though uncontradicted, are worth no more than the reasons and factual data upon which they are based" *Griffith v. Cnty. of Los Angeles*, 267 Cal.App. 2d 837, 847 (1968). We apply this to all witnesses, not just CCSF's witness.

4.4. PG&E's Lack of Knowledge of Unsafe Conditions

4.4.1. CPSD's Position

PG&E's witnesses made several references to PG&E's lack of knowledge or awareness of unsafe or non-compliant conditions. For example, PG&E witness Harrison testified that "PG&E acknowledges that, during the Segment 180 construction, it unknowingly and unintentionally installed a piece of pipe that was missing an interior seam weld." Exhibit PG&E-1 at 2-1. Other examples where PG&E refers to its lack of knowledge or awareness appear in the testimony of PG&E witnesses Harrison and Keas.

CPSD believes that these references by PG&E to its "mental state" may be associated with an attempt by PG&E to claim ignorance of deficiencies or unsafe conditions as a defense against the violations charged by CPSD. CPSD

maintains, however, that it is well-established that public welfare offenses are strict liability offenses[19] unless they specifically state a different mental state requirement. Thus, CPSD argues, it is not required to prove PG&E's mental state with regard to the alleged violations. CPSD acknowledges that PG&E's mental state is one factor in considering the size of a monetary penalty.

4.4.2. PG&E's Position

Claiming that it cannot be held accountable for what it did not know, PG&E argues that CPSD's alleged violations are inappropriately based on hindsight. As an example of such an improper allegation, PG&E cites the claim that PG&E violated the yield strength standards in ASA B31.1.8-1955 and API 5L because the six pups in Segment 180 did not have yield strength of 52,000 psig. PG&E understands that the alleged violation is based on the position that PG&E should have used an assumed SMYS value of 24,000 psig pursuant to the federal regulations because the pups were manufactured to an "unknown" specification. Acknowledging that 49 CFR 192.107 provides that an operator must use a yield strength of 24,000 psig for pipe "whose specification or tensile properties are unknown" and that has not been tensile tested, PG&E contends that the section only applies when the operator is aware that it has pipe with unknown specifications. PG&E argues that CPSD's position "is not supported by any evidence that pre-dates the San Bruno accident" (PG&E Opening Brief at 41), and that only hindsight knowledge developed by the NTSB after September 9, 2010 allows CPSD to assert that the yield strength of the six pups was unknown.

[19] Citing Black's Law Dictionary, 6th Ed, CPSD explains that a strict liability offense is an unlawful act which does not require proof of mental state.

Further explaining its opposition to CPSD's "hindsight"-based allegations, PG&E argues that prior to September 9, 2010 its records contained pipe attribute information for all of Segment 180, including the pipe yield strength, and to its knowledge, it was not missing the SMYS value for any of the pipe in Segment 180. PG&E states that following the rupture, it became clear that the pipe attribute information for Segment 180 was incorrect with regard to SMYS value (42,000 psig instead of 52,000 psig) and seam type (seamless instead of double submerged arc welded (DSAW) pipe).[20] PG&E maintains that before the Segment 180 rupture on September 9, 2010, it had no reason to think it needed to use an assumed SMYS value for any portion of Segment 180, arguing that incorrect information is not "unknown" information that would alert an operator to the need for an assumed value.

As another example of what it considers to be an improper, hindsight-based CPSD allegation, PG&E objects to the assertion that it should have deemed DSAW pipe to be subject to a long seam manufacturing threat and conducted integrity management assessments on that basis. In response to this allegation, PG&E contends that industry experts and pipeline regulators, as well as pipeline safety standards and regulations, all considered DSAW pipe to be reliable and safe, not subject to a long seam threat. PG&E refers to its witness Caligiuri, a metallurgical engineer who testified that DSAW pipe was the highest-quality pipe of that size PG&E could have used when Segment 180 was constructed. PG&E goes on to note that the federal pipeline safety regulations identified DSAW pipe as having a joint efficiency factor of 1.0. Under the AMSE B31.8S

[20] DSAW refers to a manufacturing method where the longitudinal seam is welded first on the outside of the pipe and then on the inside.

code, by definition this eliminated the need to consider potential longitudinal seam manufacturing threats on that pipe. ASME B31.8S-2004, § 6.3.2 ("Seam issues have been known to exist for pipe with a joint factor of less than 1.0.").

PG&E claims that it is only by information gained in the aftermath of the Segment 180 rupture and explosion that it knew or could have known about the missing internal welds in the pups. Thus, according to PG&E, CPSD's contention that PG&E should have concluded the DSAW pipe in Segment 180 was subject to a long seam manufacturing threat, and that it constitutes a violation of law, represents an improper hindsight judgment.

4.4.3. Discussion

We will further evaluate alleged violations regarding Segment 180 construction in Section 5.1 below and alleged integrity management violations regarding the manufacturing seam threat issue under Section 5.2 below. Here, we focus on the merits of PG&E's "hindsight" contentions. We first note that, as CPSD argues, public welfare offenses are strict liability offenses. *Investigation re Communication TeleSystems International*, D.97-10-063, 76 CPUC 2d 214, 218. This means that CPSD is not required to prove that PG&E knew about unsafe conditions or deficiencies that were in violation of the law. Further, as the Commission has stated, "[f]urnishing and maintaining safe natural gas transmission equipment and facilities requires that a natural gas transmission system operator *know* the location and essential features of all such installed equipment and facilities." D.12-12-030 at 91-92 (emphasis added).

Thus, CPSD is not required to prove that PG&E was aware of defective conditions in the Segment 180 pups. Additionally, there is little merit in PG&E's claim that to be held liable for failing use conservative yield strength values, an operator must be aware that it has pipe with unknown specifications. PG&E's

knowledge or lack thereof is irrelevant to the question of whether the applicable laws were violated.

We note that 49 CFR 192.107(b)(2) states that 24,000 psi for yield strength must be used on pipe "whose specification or tensile properties are unknown" and that Section 811.27(G) of ASME B31.1.8 applies when "yield strength, tensile strength or elongation for the pipe is unknown." The Segment 180 pups were not built to any known specifications, *i.e.*, they were built to "no known specification." The pups' specifications were actually unknown by PG&E. It is not relevant whether PG&E knew that the specifications were unknown. PG&E's claim that 49 CFR 192.107 "only applies…when the operator is aware that it has pipe with unknown specifications" (PG&E Opening Brief at 41) cannot be sustained. That is a strained interpretation and would improperly require that CPSD prove that PG&E was aware that it did not know the true specifications for Segment 180. PG&E does not cite any law or case that supports the proposition, and we decline to accept it.

Even though CPSD is not required to prove that PG&E was aware of the unsafe pups, we note that ignorance of their condition is inexcusable in light of requirements for visual examination, post-installation testing, threat identification, leak/rupture data gathering, etc., that should have led to the discovery of the missing records, or the pups themselves. There is evidence that PG&E could have, and should have, discovered it was missing relevant data. For example, Segment 180 specifications in PG&E's GIS came from Pipeline Survey Sheet (PLSS) map 385121, which contained the incorrect information that Segment 180 was 30 inch seamless pipe. The data in PLSS map 385121, in turn, came from journal voucher 174143. After the San Bruno explosion and fire, PG&E discovered engineering documents related to Segment 180, filed under job

number 136471, which showed that the Segment 180 was DSAW and not seamless. PG&E's quality control failed to cross check the PLSS data against available engineering documents and correct the seamless designation at the time the PLSS was created and again at the time the data was transferred to GIS. It is reasonable to conclude that PG&E should have known that its records were deficient and should have used the value of 24,000 psi for the yield strength (see Section 811.27(G) of ASME B31.1.8-1955) because PG&E had multiple chances to realize that its data for Segment 180 was erroneous.[21]

With respect to the allegation that PG&E failed to deem DSAW pipe to be subject to a long seam manufacturing threat, PG&E's reliance on its improper hindsight argument similarly cannot be supported. Even if operators and regulators considered DSAW pipe to be reliable and not subject to a long seam threat, that is an over-simplification of what was known by PG&E. The fact is that not all DSAW pipe was considered safe and reliable. PG&E had several warnings that the DSAW pipe on Line 132 had potential issues. First, PG&E's records show that the 1948 DSAW pipe from Consolidated Western had seam quality issues based on the rejection of some seam welds noted in the limited girth weld x-rays taken during installation, and seam leaks and cracks found since the installation date. PG&E has stated its belief that the pipe in question was most likely produced by Consolidated Western in 1948, 1949 or 1953. Thus,

[21] In addition, as CSB points out, there are several broad indicators that PG&E knew or should have known of unsafe gas pipeline system conditions. PG&E's Gas Operations warned company management in the 1980's of the dangers of deteriorating infrastructure and proposed a Gas Pipeline Replacement Plan (GPRP) that would have facilitated replacement of Line 132. PG&E sought and received approval of the GPRP and cost recovery therefor. Also, Bechtel warned PG&E that it lacked critical information concerning its natural gas pipelines, undermining risk management efforts.

PG&E had in its possession information demonstrating that DSAW pipe from this company, in this time frame, was suspect. Second, the *Integrity Characteristics of Vintage Pipelines* report,[22] referenced by PG&E in its first revision of Risk Management Procedure (RMP)-06, identifies DSAW as having manufacturing defects, including seam and pipe body defects. Third, as the NTSB discovered, Line 132 has suffered several DSAW seam leak incidents.

Accordingly, PG&E's "improper hindsight" argument against CPSD's alleged long seam threat assessment violation fails. Documentation that PG&E possessed proves that DSAW pipe manufactured during some years by some manufacturers constituted a threat that PG&E should have considered. Based on the reports of known seam issues on this particular vintage of pipe, and the leak incidents on Line 132, PG&E should have been aware that some of the DSAW pipe in Line 132 had known seam issues.

If we were to accept PG&E's ignorance of its own system conditions as a defense in this proceeding, or conclude that PG&E had no responsibility to discover unsafe conditions, we would create an unacceptable risk that no utility would ever save records showing that its system contains flaws, such as leak survey records. Strict liability means that the sole inquiry is whether the violation occurred, not whether PG&E knew that it was violating the law when it did so. For those violations that involve unknown specifications of pipeline, such as 49 CFR 192.107(b)(2), the sole inquiry is whether the specifications were

---

[22] Clark, E.B.; Leis, B.N.; and Elber, R.J., *Integrity Characteristics of Vintage Pipelines*, October 2004, prepared by the Battelle Memorial Institute for the INGAA Foundation. Exhibit PG&E-1C at 4-21. The INGAA Foundation is an industry association. Exhibit CPSD-1 at 42, Footnote 48.

known or unknown to the utility, not whether the utility knew that it did not know.

4.5. Adequacy of Notice of Alleged Violations

4.5.1. Overview

Section X of the January 12, 2012 CPSD Report (Exhibit CPSD-1 at 162-163), entitled "PG&E's Violations of Applicable Laws and Regulations," is a two page discussion of alleged actions or failures by PG&E that, CPSD asserts, constitute violations of the Public Utilities Code, Commission orders, industry standards, and/or federal regulations. By PG&E's count, CPSD charged 18 violations in Section X.[23] However, CPSD included with its opening brief (1) proposed conclusions of law (Appendix B) representing 55 alleged violations and (2) an appendix (Appendix C) that listed 55 alleged violations along with a designated range of dates for violations alleged to be continuing. As explained in Section 4.5.2 below, CPSD subsequently revised Appendix C in response to rulings by the ALJ.

In its reply brief, PG&E argues on due process grounds that Revised Appendix C should either be struck or ignored, and that CPSD should only be allowed to pursue (and, therefore, the Commission should only consider) the violations that were specifically alleged in Section X of the CPSD Report. PG&E contends that its June 26, 2012 written testimony, decisions it made regarding cross-examination, and the defense it presented at the evidentiary hearings were in response to the violations asserted in Section X, without knowledge of all of the violations that CPSD would eventually allege. PG&E also objects to CPSD's

[23] CPSD, in response to a PG&E motion to strike Appendix C of CPSD's opening brief (see Section 4.5.2 below), takes issue with PG&E's count of only 18 violations.

now asserting 37 continuing violations where, according to PG&E, previously CPSD had identified just one continuing violation.

4.5.2. PG&E's Motion to Strike Appendix C

On March 18, 2013, PG&E filed a motion to strike Appendix C on the grounds that it improperly alleged new violations after the close of hearings, in violation of PG&E's due process rights. By electronic ruling issued on April 2, 2013, confirmed and memorialized in a written ruling filed on May 2, 2013 (April 2 Ruling), the ALJ granted in part and denied in part PG&E's motion to strike. The April 2 Ruling determined that it was not necessary for the Commission, in the OII, or CPSD, in the CPSD Report, to set forth the legal bases for its alleged violations because legal issues could be addressed in post-hearing briefs. With respect to the factual bases for alleged violations, the ruling provided that "if a statement of alleged facts constituting a violation is set forth in the OII or in its referenced documents [i.e., the NTSB, IRP, and CPSD reports], then PG&E had adequate notice prior to evidentiary hearings of the factual allegations that it needed to defend against." April 2 Ruling as memorialized in May 2, 2013 ALJ's ruling, Appendix A at 17-18. The ruling did not accept PG&E's contention that the Commission intended Section X of the CPSD Report to be the exclusive charging document in this investigation.

In response to PG&E's contention that, with respect to certain violations, the factual basis for the allegation was not adequately set forth in the OII or its referenced documents, the April 2 ruling struck Appendix C as originally filed but authorized CPSD to re-issue Appendix C to show, for each alleged violation, specific reference to where the OII or its referenced documents provided PG&E with notice of the factual basis for the allegation. The ruling provided that to the

extent, if any, that PG&E took issue with CPSD's factual references in Revised Appendix C, PG&E could address such issues in its reply brief.

On April 8, 2013 CPSD submitted a revised Appendix C pursuant to the April 2 ruling. On April 18, 2013, in response to an April 12, 2013 ruling clarifying the authorized filing, CPSD filed a second revised Appendix C to its opening brief.

4.5.3. Is Section X the Sole Source of Notice?

PG&E claims that the two-page Section X of the CPSD Report is the only statement of the alleged violations consistent with due process. This claim rests in part on the notion that, since CPSD included a section in its report with the title "PG&E's Violations of Applicable Laws and Regulations," only the allegations specified within that section can be considered by the Commission. According to PG&E, the caption of Section X "would lead any reader to believe it contains a list of violations CPSD alleged, a list sufficiently specific that PG&E never felt the need to ask a data request to pin down CPSD's allegations." PG&E's March 26, 2013 Reply to Opposition of CPSD to PG&E's Motion to Strike Appendix C to CPSD's Opening Brief at 1. This argument does not stand up to analysis.

First, we note that the list of violations in Section X was by its own terms subject to augmentation at a later date. Preceding a list of specific violations of Title 49 CFR is the following sentence: "To date, CPSD's investigation has discovered the following violations of 49 CFR Parts 192 and 199 (CPSD's investigation is ongoing)." CPSD Report at 163. PG&E was on notice that CPSD did not consider Section X to be the final list of alleged violations. Also, CPSD's reference to its ongoing investigation must be read in concert with the Commission's statement providing that "[i]f staff later believes it has good cause

to assert additional violations beyond those described herein and in CPSD's Report, staff may bring the matter to the Commission's attention in this docket…" OII at 10. These statements clearly undermine any contention that Section X was to be the final word regarding alleged violations.

Second, statements providing notice of alleged violations are found throughout the CPSD Report, not just in Section X. The Executive Summary presents a summary of findings that includes several specific code violations being asserted by CPSD (CPSD Report at 3-4) and a discussion of applicable laws and regulations that would form the legal bases for alleged violations (*Id*. at 5-6). In the Executive Summary, one of CPSD's allegations is that "PG&E violated the Public Utilities Code, Section 451 for allowing deficiencies to exist in its SCADA system which interfered with its ability to detect and respond to the emergency." *Id*. at 4. Because this allegation does not appear in Section X, PG&E in effect argues that it must be ignored because CPSD did not provide adequate notice of it. We find this position relies on an unjustifiably strict interpretation of Section X that ignores the CPSD Report as a whole. As another example of an allegation that appears outside of Section X, CPSD claims that "PG&E violated Public Utilities Code Section 451 by installing and operating its system in an unsafe manner" (*Id*. at 15) and follows that statement with a discussion of deficiencies that supports this allegation. Similar statements are made at pages 26, 27, 70, 84, 99, and 103 of the CPSD Report.

Third, the OII itself—the Commission's order creating the formal investigation—is a source of notice of violations. The OII, by reference to other documents such as the CPSD Report, the NTSB Report, and the IRP Report, includes those documents. Nonetheless, if we were to strictly apply the standard that the only violations that can be considered are those specified in a particular

section of the CPSD Report, then any statement in the OII providing notice of an alleged violation would be of no consequence.

Finally, with respect to PG&E's argument that it did not receive adequate notice that numerous violations would be alleged to be continuing violations, we note that the OII advised PG&E as follows:

> We also note that it appears, based on the allegations in the CPSD report, that PG&E's violations of safety law and standards may have occurred over long periods of time. If the Commission finds this allegation supported by the evidence, the Commission will consider ordering daily fines for the full duration of any such violations, even if this encompasses a lengthy period of time. OII at 9.

PG&E cannot reasonably claim there was inadequate notice that it faced allegations of continuing violations.

PG&E's claim that Section X of the CPSD Report is and can be the sole basis for alleged violations that may be considered by the Commission is not reasonable. It is not supported by citation to statutory or case law. Any suggestion that PG&E was caught off guard when it prepared its testimony and determined its defense at hearings, because the title of Section X induced it to rely solely Section X to the exclusion of any other indications in the OII or its referenced documents, cannot be sustained. A careful reader would not be misled by the title of Section X.[24]

---

[24] We note, however, that presentation of a better organized specification of alleged violations early in the process would have promoted much greater efficiency in the litigation and deliberative processes. Among other things it would have led to better organized and more focused post-hearing briefs. The ALJ believes that many months of hearing and decision preparation time could have been saved if the proceeding had begun with a clear and more precise statement of alleged violations. The Commission directs its staff to address this in future investigations.

4.5.4. Did CPSD Improperly Make Post-Hearing Allegations?

PG&E argues that neither the April 2 Ruling nor revised Appendix C resolves the due process defects PG&E identified in its motion to strike Appendix C. With respect to the ruling, PG&E takes issue with its central determinations that a statement of facts constituting a violation that appears in the OII or its referenced documents provides adequate notice prior to evidentiary hearings of the factual allegations it needed to defend itself against, and that notice of the legal bases for the allegations could be provided in CPSD's opening brief. According to PG&E, "[d]ue process requires more than a mere factual description in the OII or 'referenced documents' that CPSD will later—after the close of evidence—turn into alleged violations." PG&E Reply Brief at 20.

Citing *Salkin v. Cal. Dental Ass'n*, 176 Cal.App. 3d 1118, 1121 (1986) (quoting *Hackethal v. Cal. Med. Ass'n*, 138 Cal.App. 3d 435, 442 (1982)) for the proposition that among the "basic" requirements of due process are notice of the charges and a reasonable opportunity to respond,[25] and *Pinsker v. Pac. Coast Soc'y of Orthodontists*, 12 Cal. 3d 541, 555 (1974) for the similar proposition that such "basic ingredient[s]" of fair procedure are essential safeguards of the "fundamental principle of justice" that no party may be "prejudiced in [its] rights without an opportunity to make [its] defense," PG&E argues that a violation of these basic guarantees occurs where new charges are introduced after the accused has already made its defense.

[25] The actual quote is: "Adequate notice of charges and a reasonable opportunity to respond are basic both to due process and fair procedure." *Salkin* 176 Cal.App. 3d at 1121, (quoting *Applebaum v. Board of Directors*, (1980) 104 Cal.App. 3d 648, 657).

PG&E goes on to note that California courts have condemned the late assertion of new charges in administrative enforcement proceedings, citing *Rosenblit v. Superior Court*, 231 Cal.App. 3d 1434 (1991). In *Rosenblit* the Court of Appeal decried disciplinary proceedings in which the accused "was kept in the dark about the specific charges made against him" as being "a charade" and "offen[sive]" to "even an elementary sense of fairness." 231 Cal.App. 3d 1447-48. PG&E also notes that in *Smith v. State Bd. of Pharmacy*, 37 Cal.App. 4th 229 (1995), the court denounced the board's mid-hearing change of legal theories as violative of "the basic ... elements" of due process because the respondent was "misled by the [initial] accusation" as to what charges he would have to defend against. *Smith*, 37 Cal.App. 4th at 242. "[F]undamental fairness," the court concluded, "requires notice of the statutory theory in the accusation." *Smith*, 37 Cal.App. 4th at 243.

PG&E also cites *Cannon v. Commission on Judicial Qualifications*, 14 Cal. 3d 678 (1975), where the California Supreme Court agreed with a petitioner's contention that a charge not "contained in the formal notice" of proceedings "should be stricken as irrelevant." *Cannon*, 14 Cal. 3d at 695-96. In so holding the Court relied on *In re Ruffalo*, 390 U.S. 544 (1968), which found a due process violation where a county bar association added a new charge midway through a disbarment proceeding. The *Ruffalo* Court found that procedure unconstitutional due to the "absence of fair notice as to ... the precise nature of the charges," and emphasized that this deficiency "serious[ly] prejudice[d]" the respondent's right to mount a defense, saying: "How the charge would have been met had it been originally included in those leveled against [the respondent] no one knows." *In re Ruffalo*, 390 U.S. at 551-52 & n.4. *See* also *Rosenblit*, 231 Cal.App. 3d at 1446 ("It

is impossible to speculate how [the respondent] might have defended had he been informed of the specific problems with each patient.").

PG&E concludes that the basic constitutional principle derived from these cases is that due process requires that an accused receive notice of the charge, *i.e.*, what the charge is and that it is being asserted, not merely notice of facts that may or may not later be the basis for charging a violation of law.

There is no question or dispute that PG&E is entitled to due process in the form of adequate notice of charges and a reasonable opportunity to respond. As CPSD points out in response to PG&E's motion to strike Appendix C, due process requires "adequate notice" and an opportunity to be heard. *People v. Western Air Lines, Inc.* (1954) 42 Cal. 2d 621, 632. The question we face is whether CPSD's approach to providing such notice in this case, where CPSD provided greater specificity of the charges in its opening brief, deprived PG&E of its due process rights.[26] The answer turns on whether CPSD has, in effect, by providing more detail in its charges of violations, unfairly alleged a new violation or a new legal theory of a violation in its opening brief.

The cases cited by PG&E are not entirely instructive here. For example, the misleading "mid-hearing change of legal theories" (PG&E Reply Brief at 20) that the *Smith* Court found to have violated due process pertained to the license revocation of a pharmacist who was the pharmacist-in–charge of a pharmacy where the non-licensed owner had dispensed the drugs in question. *Smith v.*

[26] CPSD has explained that its approach was to "place PG&E generally on notice of the charges against [it], by citing the applicable laws in both the OII and the Staff Report." Opposition of CPSD to PG&E's Motion to Strike Appendix C of CPSD's Opening Brief at 3.

State Bd. of Pharmacy, 37 Cal.App. 4th 229. The pharmacist "was misled by the accusation and the prehearing conference statement into believing he needed to prepare a defense to the personal dispensing charges" but the State Board of Pharmacy later "shifted its theory to one of negligence by Smith as the pharmacist-in-charge of [the pharmacy]." *Id*. at 242. The *Smith* Court went on to note that the statutory "provision on which the Board relied to uphold its negligence theory . . . is not mentioned in the ALJ's determination of issues." *Id*.

PG&E has not persuaded us that CPSD's providing greater specificity in charges in its opening brief represents a misleading change of legal theory that is in any way equivalent to the unfair change found unacceptable in *Smith*. From the outset of this proceeding CPSD has consistently argued that 49 CFR 192 and Section 451 are applicable, and PG&E was on notice of this position. In its opening brief CPSD has provided greater specificity by referencing subsections of the sections already discussed in the CPSD Report. In doing so, unlike the Board of Pharmacy in *Smith,* CPSD has not made a mid-hearing change of legal theories. Going from a summary of allegations in Section X stating that "PG&E violated various requirements of 49 CFR 192, Subpart O, in its implementation of the Integrity Management process, including incomplete data gathering and integration, flawed threat identification, flawed risk assessment and using an incorrect assessment methodology" (CPSD Report at 162) to more specific statements of such violations in the CPSD opening brief does not amount to misleading PG&E or asserting a new legal theory of charges.

Similarly, the circumstances that led the court in *Rosenblit* to find a due process violation because a physician being denied hospital privileges was "kept in the dark about the specific charges made against him"(*Rosenblit v. Superior Court*, 231 Cal.App. 3d at 1448) are distinguishable from the circumstances here.

Rosenblit "was first informed his privileges were suspended due to his exercise of poor clinical judgment." *Id*. at 1445. "The hospital supplemented its initial notification within a few days by expanding the charges to include problems either with 'fluid management, diabetic management, or clinical judgment' in 30 different cases. The 30 questioned charts were listed numerically without any indication as to what purported deficiency applied to each one." *Id*. at 1445-46. Prior to an administrative hearing, Rosenblit had asked the hospital for a more complete statement of the charges against him, including the specific acts or omissions alleged. *Id.* at 1438. He or counsel on his behalf wrote six letters pleading for a description of the acts or omissions charged. *Id*. at 1446.

If, at the outset of this proceeding, CPSD had merely put forward generalized allegations such as "problems with pipeline management" or if CPSD had denied any PG&E request for additional information about the charges it had made in the CPSD Report, *Rosenblit* might have applicability here. However, a fair reading of the CPSD Report demonstrates that PG&E was not kept in the dark. The applicable laws and regulations as well as the alleged acts and omissions relied upon by CPSD were described in the OII and in the CPSD Report.

PG&E's citation to *Canon* goes more directly to the issue raised by the April 2 Ruling, *i.e.*, the extent to which it is permissible to provide a factual description of violations prior to evidentiary hearings, and provide the full legal basis for the violation in a post-hearing brief. In a case involving removal of a municipal court judge for judicial misconduct, the court struck, "although perhaps factually supported," a charge of judicial interference in the operation of the public defender's office because the charge had not been "contained within the charged misconduct." *Cannon v. Commission on Judicial Qualifications*, 14 Cal.

3d 696. Even here, however, the different underlying circumstances render the case inapplicable. Notwithstanding any suggestion in the April 2 Ruling to the contrary, the fact is that the OII and the CPSD Report did not merely provide a listing or discussion of facts that would later be used in CPSD's opening brief to assert legal violations for the first time. As noted earlier, CPSD has consistently argued that 49 CFR Parts 192 and 199 and Section 451 are applicable. The OII at pages 6-7 lists all of the state and federal laws applicable to natural gas pipeline safety. A fair reading of the OII and the CPSD Report shows that CPSD in fact did provide more than a mere factual description of alleged violations. We conclude that under the approach followed by CPSD, PG&E in most instances received adequate notice of what the charges were prior to the hearing. We will evaluate notice issues associated with specific alleged violations in Section 5.

4.5.5. PG&E's Request to Strike or Ignore Revised Appendix C

Revised Appendix C is a guide to assist the Commission in reviewing a complex record, and PG&E had an opportunity respond to it. We note that it is clearly and explicitly based on CPSD's statement of alleged violations in Appendix B, which PG&E did not seek to strike.[27] CPSD produced Appendix C to clarify dates of alleged violations and ranges of dates for alleged continuing violations. Because Revised Appendix C is helpful to the Commission's

[27] Appendix B to CPSD's opening brief sets forth CPSD's proposed conclusions of law. Each is framed as a statement of a violation. Except with respect to violation dates and date ranges, we accept Appendix B as CPSD's final and complete statement of 55 alleged violations in this proceeding. CPSD has specified alleged dates and date ranges of violations in Revised Appendix C to its opening brief.

understanding of CPSD's position in this proceeding, and preserving it is not prejudicial to PG&E, it will not be struck or ignored.

4.6. Authority of Intervenors to Allege Violations

PG&E contends that only CPSD, and not the intervenors, can act as prosecutor and allege violations in Commission-initiated enforcement proceedings such as this. According to PG&E, CPSD's prosecutorial independence and discretion would be usurped if other parties could allege violations. PG&E cites to *Investigation of Prime Time Shuttle International, Inc.*, D.96-08-034, 67 CPUC 2d 437 (1996), where the Commission likened enforcement staff to a "prosecutor" and stressed the "separation of prosecutorial and quasi-judicial functions within the agency." *Id*. at 477. PG&E also cites to *Union Pacific Railroad Co.*, D.93105, 6 CPUC 2d 196 (1981), where the Commission noted that "[t]he staff had the burden of proof in this investigation" (*id*. at 200) and to *Investigation Re. Conlin-Strawberry Water Co. Inc.*, D.05-07-010 (2005), where the Commission stated that it would "violate[] California constitutional law" to place the burden of proof on respondents in an enforcement proceeding "where substantial property rights are at issue" (*id*. at 16). Asserting that the "staff-as-prosecutor framework is consistent with several defining features of enforcement proceedings" (PG&E Reply Brief at 160), PG&E suggests that the assignment of the burden of proof to CPSD underscores the prosecutorial nature of the CPSD role.

That the role of our enforcement staff is similar in some respects to the role of a prosecutor is not dispositive. None of the above cases cited by PG&E speaks directly to the issue at hand—whether intervenors can participate in an enforcement case led by CPSD by alleging violations in addition to those alleged by CPSD. Another case cited by PG&E, *Application of Pacific Gas and Electric*

Company, D.97-08-055, 73 CPUC 2d 754 (1997) does address the issue of intervenor participation:

> The sanctity of the Commission's rules is not a matter that private parties or the [Office of Ratepayer Advocates] can settle. Violations of our rules cannot be forgiven or traded for other concessions. Only the enforcement staff of the Commission (e.g., Consumer Services Division or other authorized enforcement staff) can negotiate a settlement with a utility involving Rule 1 violations, subject to an independent determination by the Commission as to whether to approve the settlement. The settlement of such violations should not be merged into a settlement of other unrelated issues. *Id*. at 780.

However, that holding was clearly limited in scope to settlement of PG&E's alleged violation of Rule 1 of the Commission's Rules of Practice and Procedure in conjunction with settlement of other issues.[28] It therefore has no applicability in this proceeding, where there is no proposed settlement of an alleged Rule 1 or Rule 1.1 violation.

PG&E cites *Heckler v. Chaney*, 470 U.S. 821, 831-32 (1985) for its argument that an enforcement agency must retain discretion to exercise its enforcement authority, or to exercise it in a particular way. However, in this proceeding we have exercised our discretion by inviting full intervenor participation:

> The Commission … invites and encourages interested parties to actively participate in this proceeding, as it involves important safety and other policy matters. The record in this proceeding and the Commission's ultimate disposition will benefit from the expertise, participation, and evidence of other parties." OII at 9-10.

[28] Rule 1 has been amended and recodified as Rule 1.1. Both the current rule and its predecessor represent a code of ethics, requiring among other things that those who appear before the Commission not mislead the Commission or its staff.

PG&E does not show how CPSD's prosecutorial independence and discretion would be, or was in this proceeding, in any way usurped by the ability of intervenors to participate by alleging violations. We find no legal requirement to preclude such participation, and as a matter of policy we approve it here as we have in the past.[29] Notwithstanding PG&E's argument that the "Commission did not and could not delegate its investigatory and enforcement authority to the [i]ntervenors" (PG&E Reply Brief at 160), allowing them to allege violations in this case is entirely consistent with our invitation to intervenors in the order instituting this investigation.

While we allow intervenors to allege violations in this proceeding, we hold them to the same standard of notice to which we hold CPSD, *i.e.*, intervenors must provide adequate notice of alleged violations and there must be an opportunity for PG&E to respond to the allegations.

4.7. Continuing Violations

As noted earlier, 37 of the 55 violations alleged by CPSD are alleged to have occurred over some period of time. This is significant because Section 2108 provides in part that "in case of a continuing violation each day's continuance thereof shall be a separate and distinct offense."

Using the example of CPSD's allegation that PG&E violated Section 451 "by failing to visually inspect segments" (CPSD Opening Brief, Revised

---

[29] In D.04-12-058, *Investigation on the Commission's Own Motion into the Operations, Practices, and Conduct of Pacific Bell Wireless LLC dba Cingular Wireless* (2004), the Commission penalized Cingular based on the extensive evidence submitted by all parties, including the Utility Consumers' Action Network as well as CPSD. Similarly, in D.08-09-038, *Investigation on the Commission's Own Motion into the Practices of Southern California Edison Company* (2008), the Commission considered proposals by DRA and TURN.

Appendix C at 1), which CPSD asserts is a separate violation every day from 1956 to September 9, 2010 (*id.*), PG&E argues that CPSD's allegations of continuing violations suffer from a common defect. As PG&E sees it, CPSD's view seems to be that an offense arises on the day of an event and continues for as long as the resulting consequence or condition continues, with each intervening day constituting a new and separate violation. PG&E maintains, however, that even if it failed to visually inspect the Segment 180 pups during installation, that event occurred once in 1956, not again every day thereafter through September 9, 2010. PG&E argues that the law does not permit CPSD to compound a single act into daily violations for 54 years.

CPSD's allegations of continuing violations are, in part, fact-specific matters that we address in Section 5 of this decision. Here, we note as a general matter our concurrence with PG&E that for a continuing violation to occur under Section 2108, it is the violation itself that must be ongoing, not its result. As PG&E notes, this view is consistent with *People ex rel. Younger v. Superior Court*, 16 Cal. 3d 30 (1976), where the Court resolved a statutory ambiguity in Water Code Section 13350(a), preferring the interpretation that a penalty for an unlawful oil deposit should be based on each day the process of deposit lasted and not each day the oil remained on the water. *Id*. at 43.

With respect to the specific example discussed by PG&E, it is only logical that a requirement to visually inspect a pipe segment prior to or during installation cannot be continuously violated after the installation has occurred.[30]

[30] As PG&E points out, once the pipe was in the ground, internal visual inspection could not be performed on Segment 180 without modifying the pipeline. PG&E Reply Brief at 27, footnote 125. We note that this determination is limited to the underlying

Footnote continued on next page

It is important to note, however, that installation of an unsafe segment of pipe, especially where the unsafe condition could have been detected and prevented if a required inspection had been performed, could result in a continuous violation of the utility's safety obligation under Section 451 if the unsafe condition is allowed to persist unremediated over time.

4.8. Laches

Pointing out that CPSD has overseen and regulated PG&E's gas operations for years, that such oversight includes audits and inspections, and that CPSD has made findings and asserted violations against it in the past, PG&E asserts the defense of laches to argue CPSD is precluded from pursuing continuing, "belated allegations" (PG&E Reply Brief at 29) pertaining to integrity management and emergency plan requirements. PG&E contends that CPSD's delay in alleging decades-old deficiencies is unreasonable and prejudicial.

Even though CPSD audits may not have uncovered violations now at issue, PG&E's arguments are without merit. The public safety mandate in Section 451 and the requirements in 49 CFR Parts 192 and 199 are intended to protect the public from the inherent dangers associated with transporting gas

---

specific factual situation and is distinguishable from Resolution ALJ-277. There, we denied PG&E's appeal of a CPSD citation for violations of gas safety requirements and ordered PG&E to pay a fine of $16,760,000 for failure to survey distribution mains and services for leaks within five years as required by 49 CFR 192.723(b)(2). Resolution ALJ-277 determined there were continuing daily violations from the date of a missed leak survey (although it accepted CPSD's recommendation to assess penalties on a monthly basis), rejecting PG&E's assertion that there could only be one violation each five years. Resolution ALJ-277 at 3-4. The Commission stated that "the responsibility to conduct a leak survey continues every day after the missed survey date until the survey is conducted. Each missed day is a violation." *Id*. at 4.

under high pressure. PG&E has an ongoing obligation to operate its transmission pipeline system in a safe manner. To conclude that this enforcement action is barred by laches would undermine this public safety mandate. As held by the California Supreme Court, no equitable principle (such as laches) may be invoked against a governmental body "where it would operate to defeat the effective operation of a policy adopted to protect the public." *Kajima/Ray Wilson v. Los Angeles County Metropolitan Transportation Authority* (2000) 23 Cal. 4th 305, 316.

As we stated in *In re Southern California Edison Company* (2004), D.04-04-065 at 15, "[t]he system of notices and fines that we have historically employed to accomplish that goal [to maximize the safety and reliability of the electric distribution system] balances encouragement to the utility to correct violations in order to avoid fines, on the one hand, with fines for failures to act, on the other." To find that the doctrine of laches would serve as a bar to bringing enforcement proceedings for longstanding violations that were only recently discovered would limit the Commission's ability to impose penalties to deter future wrongdoing. Such a result would provide no incentive to utilities to correct violations once it became aware of them and be contrary to the overarching objectives of Section 451 to provide safe and reliable service.

Accordingly, we find that the doctrine of laches does not bar CPSD from bringing this enforcement action.

4.9. Remedial Measures

PG&E presented evidence regarding its efforts to improve the safety of its gas transmission system and operations following the San Bruno explosion and fire. In particular, PG&E's prepared testimony includes a 16 page discussion of PG&E's "Enhanced Focus on Public Safety and Operational Excellence." Exhibit

PG&E-1A, Chapter 13. PG&E witness Yura states that "[s]ince the San Bruno accident, PG&E has made, and is continuing to make, significant improvements to increase its focus on public safety and operational excellence." *Id.* at 13-1.

Even though it introduced this evidence, PG&E objects to CPSD's and intervenors' attempts to use PG&E's improvement efforts against it. Specifically, PG&E objects to the inference that PG&E's improvement initiatives signify that there were prior violations of law. DRA, for example, asserts that "PG&E's extensive remedial activities undertaken since the San Bruno explosion, in large part pursuant to recommendations of the NTSB and orders of the Commission, also belie PG&E's argument that it had been following industry standards since the 1956 installation." DRA Opening Brief at 7. Supporting its objection, PG&E cites Evidence Code Section 1151, which states:

> When, after the occurrence of an event, remedial or precautionary measures are taken, which, if taken previously, would have tended to make the event less likely to occur, evidence of such subsequent measures is inadmissible to prove negligence or culpable conduct in connection with the event.

PG&E also cites *Alcaraz v. Vece*, 14 Cal. 4th 1149, 1168-69 (Cal. 1997) (subsequent remedial measures are not admissible evidence of culpable conduct under Evidence Code Section 1151) and *Gilliam v. American Casualty Co.*, 735 F. Supp. 345, 351, n.9 (N.D. Cal. 1990) (under Federal Rule of Evidence 407, evidence of subsequent remedial measures is not admissible to prove culpable conduct by the party taking those measures).

As several of the intervenors observe, the reach of Evidence Code Section 1151 is not unlimited. DRA notes that while remedial measures are not admissible "to prove negligence or culpable conduct in connection with the event," such evidence may be used for other purposes. "This rule does not

require the exclusion of evidence of subsequent measures when offered for another purpose, such as proving ownership, control, or feasibility of precautionary measures, if controverted, or impeachment." *Alcaraz v. Vece*, 14 Cal 4th 1149 at 1169. Also, evidence of subsequent remedial measures can be used to show that a negligent condition previously existed, and to show the possibility or feasibility of eliminating the cause of the incident, and "such evidence may be admitted to impeach the testimony of a witness who has testified that the condition prior to the accident was not a dangerous one." *Love v. Wolf*, 249 Cal.App. 2d 822, 831 (1967), citing multiple sources in support.

In *Baldwin Contracting Co. v. Winston Steel Works, Inc.*, 236 Cal.App 2d 565, 573 (1965), the court held that evidence that a contractor's carpenters installed a wooden barrier after an accident occurred was relevant and admissible as indicative of Baldwin's duty on the job and also the possibility or feasibility of eliminating the cause of the accident. Thus, evidence of PG&E's remedial conduct can be used to rebut PG&E's contentions that GO 112 and ASA B.31.8 did not require it to undertake the maintenance that CPSD and other parties contend was required under the law.

We also note that Section 1701 (a) provides that "the technical rules of evidence need not be applied" in our proceedings and Rule 13.6 (a) of our Rules of Practice and Procedure provides that the technical rules of evidence ordinarily need not be applied provided the substantial rights of the parties are preserved. There is no reason to conclude that narrowly construing Evidence Code Section 1151 here interferes with any of PG&E's substantial rights. As CCSF point out, Evidence Code Section 1151 is based on "a public policy consideration that the exclusion of such evidence encourages persons to take subsequent precautions for the purpose of promoting and encouraging safety, without fear

of having such conduct used to establish liability," and is not intended to protect any substantial right of the person undertaking the remedial measures. *Hilliard v. A. H. Robins Co.*, 148 Cal.App.3d 374, 401 (1983) (citing Law Revision Committee Comment, Evid. Code, Section 1151; Jefferson, California Evidence Benchbook (2d ed.), Evidence of Subsequent Repairs or the Subsequent Remedial Comment, Section 34.2.).

Accordingly, parties may cite to PG&E's remedial actions for reasons such as impeachment of PG&E's expert witnesses who claim PG&E met all requirements before the San Bruno explosion. It is also appropriate to consider the scope of PG&E's remedial actions in light of the fact that the NTSB ordered such actions, and whether PG&E was likely in violation of requirements given the scope of the work required to comply with the NTSB order. In summary, the Commission can consider the whole of the evidence and reach its conclusions regarding PG&E violations on that basis.

4.10. Credibility and Knowledge of PG&E Witnesses

CCSF, CSB, and DRA contend that certain PG&E witnesses lack credibility and/or personal knowledge of matters on which they testified. These parties, joined by TURN in its reply brief, focused primarily on PG&E's integrity management witnesses Zurcher, an outside consultant to PG&E, and Keas, a new PG&E employee. CCSF also raises concerns about the testimony of PG&E's outside witness Kiefner on cyclic fatigue.

CCSF contends that the Commission should accord little if any weight to the opinions of witness Zurcher. CCSF notes, among other things, that apart from his testimony in this proceeding, Zurcher and his associates were retained by PG&E's board of directors to review PG&E's gas transmission activities in 2011, including integrity management (Blacksmith Audit). Yet, CCSF notes,

Zurcher indicated that facts from the Blacksmith Audit were not relevant to his testimony in this proceeding. CCSF finds this "inconceivable." CCSF Opening Brief at 10. CCSF finds a similar problem with witness Kiefner's testimony that cyclic fatigue generally presents a low risk on natural gas pipelines. CCSF notes that that testimony is supported by two studies on cyclic fatigue in 2004 and 2007, and that the 2007 study is premised on several key assumptions that, if changed, affect his conclusions. CCSF goes on to note that Mr. Kiefner did not consider a March 2012 study by his own firm (KAI Report) that applied analysis from the 2007 study to PG&E's peninsula pipelines, even though the KAI Report contained a detailed assessment of the threat of cyclic fatigue for Line 132. CCSF concludes that PG&E's experts either deliberately excluded relevant information or prepared their testimony with a lack of care.

When PG&E served its testimony in June 2012, a former manager of integrity management, Sara Peralta, presented testimony regarding PG&E's integrity management program, including responses to CPSD's allegations that PG&E's integrity management practices violated the law. Subsequently, witness Peralta became unavailable and was replaced by Kris Keas, a former manager at Southern California Gas Company and a new PG&E employee in 2011. With corrections, the testimony that Keas sponsored was mostly written by Peralta. 9 Jt. Tr. at 906-907. Referring to Evidence Code Section 702, which provides in relevant part that "[t]he testimony of a witness concerning a particular matter is inadmissible unless he has personal knowledge of the matter," CSB contends that integrity management witness Keas lacks personal knowledge, and has no basis on which to testify to PG&E's past integrity management practices. Additionally, CSB contends that the credibility of PG&E witnesses is at issue because their testimony was extensively reviewed by, and to some extent

prepared by, several people including "high level attorneys" (CSB Opening Brief at 19). CSB also argues that PG&E's consultants lack credibility due to bias, interest, or other motive because of their high fees and dependency on related business from the utility.

DRA points to the following asserted grounds why it believes that the testimony of witness Zurcher is not credible and should be disregarded:

- He relied on materials provided by PG&E rather than his own personal observations of PG&E's actual integrity management practices.
- His analysis and conclusions did not incorporate his own prior knowledge of PG&E's integrity management practices.
- He was unwilling to agree with the NTSB on the importance of accurate records in an effective integrity management program.
- He did not confirm for himself that PG&E actually complied with integrity management regulations. DRA notes that he did not request documentation from PG&E that it complied with its own quality control requirements for entering data into the GIS system. Also, DRA notes that while he found that PG&E's use of External Corrosion Direct Assessment (ECDA) for Line 132 was an appropriate integrity management procedure, he did not consider evidence that PG&E engineers characterized ECDA as "a much less thorough evaluation of the pipeline via statistical methods rather than by direct inspection" and that PG&E's "Gas Engineering would strongly prefer to smart pig PG&E's higher stress pipelines to obtain a much better initial evaluation of the line." DRA Opening Brief at 22-3, quoting Exhibit CPSD-168 at 7-8.
- He contradicted himself on cross examination. For example, DRA notes, he testified that gas pipeline operators routinely operate above MAOP and that this is not prohibited by regulations, yet did not adequately explain why, in a case involving El Paso Natural Gas, he had testified that operators may never exceed MAOP. 8 Jt. Tr. at 789-91.

- He has close industry ties and is highly compensated, and therefore has an interest in defending PG&E's integrity management program.

DRA asserts that PG&E integrity management witness Keas' testimony is hearsay, not credible, and should be disregarded. DRA notes that she has no personal knowledge of PG&E's practices leading to the San Bruno explosion and fire but instead relies on others.

TURN concurs with the other intervenors that the testimony of witness Zurcher should be discounted as biased and unreliable. TURN contends that Zurcher showed no regard for the importance of accurate integrity management records; based his testimony on PG&E's professed policies and procedures, not a review of PG&E's actual practices; did not consider the Blacksmith Audit; has close ties to the industry and is dependent on operators as his clients; and is well-compensated by PG&E.

It is typical, and generally unremarkable, that qualified outside experts are well-compensated for their services to our regulated utilities. Also, we recognize that such experts may earn most or all of their compensation from the regulated industry. These factors could provide incentives for some experts to slant their presentations in favor of the subject utility and the industry generally. It is also not uncommon that a utility's witnesses in our proceedings will have their written testimony reviewed by, and possibly even drafted by, the utility's senior management and attorneys. Because these circumstances might yield misleading or inaccurate testimony and opinions, an important and necessary safeguard is to ensure a fair process that provides opportunity for discovery, sworn testimony subject to cross examination to test witnesses' assumptions and credibility, and opportunity for opposing parties to introduce rebuttal testimony. Such a process was available to parties in this proceeding.

We do not find it necessary or appropriate to ignore or disregard witness Zurcher's testimony and opinions as urged by intervenors. We are, however, persuaded that we should give reduced weight to his opinions where they conflict with the evidence advanced by CPSD and intervenors--for example, where Mr. Zurcher disagreed with the NTSB Report holding that PG&E's integrity management program was deficient and ineffective (8 Jt. Tr. 795-6). We are concerned that Mr. Zurcher did not adequately explain his views on the importance, or lack thereof, of accurate data in the integrity management program or his views on MAOP requirements. He also appeared to have been focused more on comparing PG&E's integrity management program with programs across the industry rather than on determining PG&E's actual compliance with applicable rules and regulations, and he appeared to have focused more on PG&E's professed integrity management policies and procedures and less on PG&E's actual practices. Even though Mr. Zurcher has long been a member of the committee that writes integrity management standards and regulations, the expertise gained from that experience alone does not make him an expert on PG&E's actual practices.

We recognize that PG&E's cyclic fatigue witness Dr. Kiefner is considered to be an expert on metal fatigue. However, as we apply his testimony to our evaluation of alleged violations associated with cyclic fatigue risk, we bear in mind that he did not consider the KAI Report in his testimony.

Hearsay testimony may be admitted in our administrative proceedings pursuant to Section 1701 (a) and Rule 13.6 (a) subject to corroboration by other evidence. Here, we do not reject witness Keas' testimony on hearsay grounds or on the basis of Evidence Code Section 702's provision for personal knowledge to the extent it was corroborated by other evidence. However, it is appropriate to

accord less weight to that testimony than we would to the testimony of a witness with personal knowledge

5. CPSD's Alleged Violations

5.1. Construction of Segment 180

5.1.1. Overview

CPSD alleges 13 continuing violations of Section 451 associated with PG&E's construction of Segment 180 in 1956. The allegations include wording to the effect that by acting contrary to an industry safety standard, PG&E created an unreasonably unsafe system in violation of Section 451. PG&E acknowledges that "in 1956 it unknowingly installed a defective piece of pipe in Segment 180, and that pipe should not have been put into service." PG&E Opening Brief at 48. Nevertheless, PG&E argues that CPSD's alleged violations related to the installation lack both factual and legal support.

As we determined earlier in this decision, PG&E's objections to CPSD's reliance on Section 451, industry safety standards, and "hindsight" knowledge gained after the San Bruno rupture and explosion are without merit. Failure to comply with industry safety standards was a violation of Section 451 even if PG&E was unaware of the dangerous condition of Segment 180. Thus, our review of CPSD's allegations is focused on the facts and interpretations of industry standards in effect at the time. As we review the individual violations alleged by CPSD, we consider and ultimately accept the NTSB's determination that:

> [T]he rupture of Line 132 was caused by a fracture that originated in the partially welded longitudinal seam of one of the six short pipe sections, which are known in the industry as "pups." The fabrication of five of the pups in 1956 would not have met generally accepted industry quality control and welding standards then in effect, indicating that those standards were either overlooked or

ignored. The weld defect in the failed pup would have been visible when it was installed. Exhibit 9, NTSB Report at x.

5.1.2. Pressure Test

CPSD contends that PG&E was required to conduct a post-installation pressure test on Segment 180 but failed to do so. The CPSD Report notes that PG&E was unable to produce records of any such test. It also contends that, based on the pipeline characteristics, the pipe would have failed any test that conformed to industry standards. CPSD characterizes this as a serious safety violation, asserting that if the required test had been done, the flawed pups would have been discovered. PG&E disputes CPSD's contentions, claiming both that no legal requirement to hydro-test existed in 1956 and that Segment 180 was, nevertheless, hydro-tested in 1956.

Section 841.31 of ASME B31.1.8-1955 provides that "All pipelines, mains and services shall be tested after construction." Section 841.412(c) requires operators to hydrostatically test pipelines in Class 3 locations to a pressure not less than 1.4 times the maximum operating pressure. Thus, to comply with the safety requirements of the ASME standards for a Class 3 location, PG&E should have conducted a post-installation hydro-test.

PG&E downplays the significance of the ASME standard, contending that in the early 1950's, hydro-testing natural gas pipelines "had not been widely adopted in the industry." PG&E Opening Brief at 52. PG&E's witness Harrison testified that in the 1950's, "testing with water wasn't necessarily the favored way to go," noting among other things that it is necessary to remove the water after the test. 3 Jt. Tr. at 355: 23-24.

Even if, as witness Harrison suggests, PG&E was resistant to implementing the evolving industry safety standards in the early to mid-1950's,

and PG&E was challenged by the technology of performing the tests at that time, PG&E has not demonstrated that a non-testing approach would have been safer than observing ASME standards. Moreover, PG&E has presented no persuasive evidence that other operators did not conduct post-installation hydro-testing at the time, although we note that non-compliance with industry standards by other operators would not excuse a Section 451 violation by PG&E. In 1955, hydro-testing was indicated by the ASME guidelines, which were the definitive industry guidelines.[31] PG&E points to no other safety standard that it reasonably would have observed at the time in lieu of the ASME testing standard. Thus, any failure to hydro-test a new Class 3 installation in 1956 was an unsafe practice in violation of Section 451.

Supporting its contention that a hydro-test of Segment 180 was in fact performed in 1956, notwithstanding its current position that there was no legal requirement to do so at the time, PG&E notes that a former employee testified in civil litigation related to the San Bruno disaster that he observed a hydro test in the same location as the Segment 180 job. PG&E also contends that the job file for Segment 180 shows the purchase of materials that would only be consistent with a hydro test. Finally, PG&E argues that a metallurgical analysis of the pup sections by its witness Caligiuri supports the conclusion that a post-installation hydro test was conducted. PG&E characterizes Dr. Caligiuri's analysis as follows:

---

[31] PG&E witness Dr. Caligiuri testified that the 1952 industry standard provided that pipeline operators "may" use hydrostatic testing and that, following a series of articles in 1954 indicating that hydrostatic testing was not general practice at that time, hydrostatic testing became a recommended industry standard practice in 1955. Exhibit PG&E-1 at 3-11.

- The rupture of Segment 180 initiated at pup 1, which was missing an internal weld along its longitudinal seam.
- A ductile tear initiated at the root of the externally welded longitudinal seam on pup 1, and fatigue crack growth from the ductile tear caused by a single loading event over time ultimately resulted in the rupture.
- Several possible causes of the ductile tear were examined and ruled out by the NTSB, including corrosion, seismic activity, and a 2008 sewer repair near the rupture location. The NTSB also determined that a hydro test at the mill would have caused pups 1, 2, and 3 to fail and could not have caused the ductile tear. Dr. Caligiuri also ruled out possible causes such as external damage to the pipeline and a sudden pressure increase later than 1956.
- Dr. Caligiuri concludes that the most likely cause of the ductile tear on Segment 180 was a post-installation pressure test in 1956. For a Class 2 location, such a test would have been conducted at 1.25 times the MAOP, or 500 psig. According to Dr. Caligiuri, that pressure would have been adequate to create the ductile tear in the pup 1 longitudinal seam without causing the pipe to fail. He also believes that it is possible the pups would have survived a test at 1.4 times MAOP, 560 psig as would be required for a Class 3 location.
- The NTSB staff found this conclusion to be credible.

CPSD argues that the evidence does not support PG&E's contention that a post-installation pressure test of Segment 180 was conducted. CPSD contends that:

- No records exist of a hydro-test on Segment 180.[32]

[32] Failure to maintain records of a hydro-test violates Section 841.417 of ASME B31.1.8-1955, which states "[t]he operating company shall maintain in its file for the useful life of each pipeline and main, records showing the type of fluid used for test and the test

Footnote continued on next page

- The hydro-test should have been to 560 psig (1.4 x MAOP). At 560 psig, it is highly unlikely that Segment 180 would have survived intact.
- According to the NTSB, the as-fabricated burst pressure for pup 3 would have been 430 psig. If a test was performed at 500 psig, that portion of the pipe would have burst.
- Because of differences in elevation, certain points on the pipe that are at a lower elevation will see higher pressures. Based on CPSD staff's field investigation, the pups in Segment 180 were located at a lower elevation than the rest of the segment between the tie-ins. Therefore, the pups would have seen a pressure higher than 500 psig, and would most likely not have survived a hydro test.
- Only one person, a former PG&E employee draftsman, recalled that a hydro-test was performed, and it is not likely that his memory is accurate.[33]

While there is evidence to support both PG&E's and CPSD's versions of history, we find that the preponderance of the evidence indicates that there was no post-installation hydro-test on Segment 180. The lack of any record of a post-installation test is both troubling in light of industry standards calling for such

---

pressure." Thus, if PG&E did in fact conduct a post-installation hydro-test on Segment 180, it violated Section 841.417.

[33] CPSD notes that when a PG&E representative went to the PG&E employee's house with two PG&E attorneys after the San Bruno explosion and showed him a plat map, he recalled that the test was 1,000 psi when clearly Segment 180 would not have survived intact to that pressure; claimed to have seen the job specifications that called for a pressure test to 1,000 psi, which implies he most likely saw the specs for a different test; recalled that the pressure testing was done to 2 times the MAOP of the pipeline although industry standards required testing to 1.4 times the MAOP; had no documents relating to any hydrostatic testing; didn't take any notes while he watched the test; acknowledged that his recollection of dates is "real foggy"; and could not recognize it as the 1956 relocation project or some other job.

records and strongly indicative that such a test was not performed. Even if materials that would be needed for a hydro test were purchased, that alone does not demonstrate that the materials were actually used to conduct a test.

Additionally, we note that Dr. Caligiuri's analysis concluded that "a 500 psig hydro test could have caused the ductile tear in Pup 1" (Exhibit PG&E-1 at 3-14) without causing the pipe to fail, which is not the same as concluding that such a test did in fact cause it. Also, while Dr. Caligiuri testified that his analysis could hold true even if the purported pressure test was conducted at 560 psig (required for a Class 3 location), it appears that his analysis was focused on a test of 500 psig consistent with a Class 2 location. Yet, Segment 180 was designed and constructed to meet the standards for a Class 3 location. We note that Dr. Caligiuri testified that even with a test at 560 psig, "it is possible that those three pups would have survived." 12 Tr. 1070-1. He did not indicate a certainty or even a likelihood that the pups would have survived such a test.

Further, Dr. Caligiuri did not confirm that metallurgical testing alone showed that a hydro-test over 50 years ago caused the rupture. He also recognized the recollections of a former employee who recalled a hydro-test in the vicinity of the rupture. However, CPSD has shown that those recollections may not be reliable.

We find significant the NTSB's finding that Pup 3 had an as-fabricated burst pressure of as low as 430 psig depending on the method used to determine burst pressure (B31G method or API 579 method), further calling into question whether a pressure test at either 500 psig or 560 psig was conducted. We note that the NTSB Report implied that even its calculated burst pressure of 430 psig could be too high as it did not take into account angular misalignment of the weld in Pup 1. Also, as CPSD explains, the pups in Segment 180 were located at

a lower elevation than the rest of the segment between the tie-ins, and the pups would have seen a pressure higher than 500 psig.

As TURN points out, Dr. Caligiuri had ruled out causes other than a post-installation pressure test, yet he acknowledged that fatigue crack growth analysis shows that the rupture would have occurred in less than ten years using actual Line 132 pressure data. Moreover, a burst pressure of 430 psig would mean that a ductile tear could have been caused by a pressure increase above 391 psig, which was exceeded by a 2003 spiking event and could have been exceeded prior to 2000 (PG&E's pressure records do not go back prior to that year).

Finally, notwithstanding Dr. Caligiuri's testimony that someone on the NTSB staff found his analysis credible, we note both that the NTSB itself did not make that finding and that the NTSB staff did not testify in this proceeding.

Even though ASME standards such as Section 841.412(c) were themselves not mandatory in 1956, PG&E created an unsafe system by acting contrary to those standards when it failed to conduct a hydrostatic pressure test on Segment 180 after its installation. It therefore violated Section 451. The requirement to conduct a pressure test was not extinguished with the passage of time; this violation began in 1956 when Segment 180 was installed and continued until Segment 180 burst and exploded in 2010.

5.1.3. Visual Inspection

Section 811.27(A) of ASME B31.1.8-1955 states:

> All pipe shall be cleaned inside and outside, if necessary, to permit good inspection, and shall be visually inspected to insure that it is reasonably round and straight, and to discover any defects which might impair its strength or tightness.

CPSD has shown that at the time of construction, a visual examination of the pipe would have detected the anomalous and defective welds of the

Segment 180 pups. Unwelded seam defects and manual arc welds ran the length of each pup and were detectable by the unaided eye and/or by touch. PG&E speculates that the pups might have been delivered double-wrapped for corrosion protection, making inspection difficult. Even if that were true, that would not explain why the missing interior seam welds were undetected. It is clear that PG&E failed to visually inspect the pups as was required by industry standards.

PG&E argues that Section 811.27(A) of ASME B31.1.8-1955 was not applicable to pipe specified for use in Segment 180, but it does not show that the standard was inapplicable to the pups that it installed. By failing to visually inspect for and discover the defects in Segment 180, PG&E violated Section 811.27(A) of ASME B31.1.8-1955, creating an unsafe system in violation of Section 451. As we noted earlier in Section 4.7, CPSD has not shown that this is a continuing violation. This violation occurred in 1956 when Segment 180 was installed.

5.1.4. Minimum Length

CPSD notes that the purpose of industry standard API 5LX (4th Ed., 1954) was to "provide standards for more rigorously tested line pipe having greater tensile and bursting strength …" Chapter VI of API 5LX mandates that "no length used in making a jointer [*i.e.*, two pieces joined by welding to make a standard length] shall be less than 5 feet." All six of the pups used for Segment 180 were less than five feet in length, which, CPSD contends, constitutes an unsafe condition.

PG&E claims that API 5LX, Specification for High-Test Line Pipe, is a standard for manufacturers, not purchasers such as PG&E. However, page 3 of API 5LX (4th Ed., 1954) contains "suggestions for ordering high-test line pipe,"

and it contains recommendations to purchasers regarding what to request when ordering pipeline. Accordingly, the standards apply to both purchasers and manufacturers. As a large purchaser, PG&E should have known that the pipe standards called for sections not shorter than five feet in length. PG&E was in fact apparently aware of the requirement when it ordered pipe from Consolidated Western, as its purchase order included the same specification.

The use of pipe sections less than five feet in length was considered an unacceptable practice according to industry safety standards in effect at the time Segment 180 was constructed. PG&E witnesses Dr. Caligiuri and Harrison assert that properly made and installed short lengths of pipe can be safe. However, PG&E has not persuaded us that these opinions should supersede or outweigh both industry safety standards that preclude the use of such short lengths and PG&E's own 1956 purchasing specifications. By installing sections in Segment 180 that were less than five feet in length, contrary to API 5LX Section VI, PG&E created an unsafe system in violation of Section 451. This violation occurred in 1956 when Segment 180 was installed.

5.1.5. Required Yield Strength

The pipe for Segment 180 was intended to meet API 5LX Grade X42 or X52 yield strengths, which indicate minimum yield strengths of 42,000 psi and 52,000 psi. Testing revealed the ruptured pups on Segment 180 had yield strengths below 42,000 psi. Pup 1, the failed pup on which the facture initiated, was found to have a yield strength of only 36,600 psi, and Pup 2 had the lowest yield strength of 32,000 psi.

Section 805.54 of ASME B31.1.8-1955 provides that "specified minimum yield strength is the minimum yield strength prescribed by the specification under which pipe is purchased from the manufacturer (psi)." CPSD contends

that the Segment 180 pups were far below required yield strengths. CPSD further contends that by installing pipe sections which did not meet the minimum yield strength prescribed by the specification under which the pipe was purchased, PG&E violated Section 805.54 of ASME B31.1.8-1955. CPSD maintains that this, in turn, created an unsafe system in violation of Section 451.

PG&E argues that Section 805.54 of ASME B31.1.8-1955 merely defines specified minimum yield strength and does not itself set a standard. On the other hand, as CPSD sees it, Section 805.54 provides guidance to operators to only use pipe with the "minimum yield strength prescribed by the specification under which pipe is purchased from the manufacturer."

CPSD has not persuaded us that the definition set forth in Section 805.54 of ASME B31.1.8-1955 alone establishes an industry safety standard for required yield strength. CPSD also has not established that installation of pipe with a yield strength of 32,000 psi would violate an industry standard or otherwise be unsafe provided that such pipe was properly tested, inspected, welded, and met all other applicable standards; and provided further that the installation of such pipe was properly recorded and that MAOP was properly set based on the yield strength. It is the failure to meet those conditions that would be unsafe and constitute one or more safety violations, not installation of lower yield strength pipe alone. Accordingly, CPSD has not proven this alleged violation.

5.1.6. Unknown Yield Strength

Section 811.27(G) of ASME B31.1.8-1955 states:

> When the manufacturer's specified minimum yield strength, tensile strength or elongation for the pipe is unknown, and no physical tests are made, the minimum yield strength for purposes of design shall be taken as not more than 24,000 psi.

The PG&E-designated yield strength for Segment 180 was 52,000 psi. However, PG&E acknowledges that it has no records showing the existence of the Segment 180 pup sections. Thus, PG&E did not know the yield strength for Pup 1. CPSD contends that by assigning a yield strength value for Segment 180 above 24,000 psi when the yield strength was actually unknown, PG&E violated Section 811.27(G) of ASME B31.1.8-1955. CPSD contends that this, in turn, created an unsafe system in violation of Section 451.

PG&E argues that CPSD did not provide notice of this alleged violation and contends that it should therefore be struck. PG&E Reply Brief at 40 and E-6. However, the CPSD Report discussed requirements to use conservative values where data are missing: "[t]wo segments with unknown SMYS were assigned non-conservative values of 33,000 psi and 52,000 psi although Part 192.107(b)(2) requires a conservative value of 24,000 psi when the exact SMYS of a pipe segment is not known or documented." Exhibit CPSD-1 at 31. The NTSB Report made similar references. Exhibit CPSD-9 at 61, 108. While compliance with the 1955 industry standard is at issue here, the underlying requirements are similar to those at issue in the referenced discussion of integrity management requirements. Accordingly, we conclude that CPSD provided adequate notice of this alleged violation.

As we discussed previously (see Section 4.4 of this decision), CPSD is not required to prove that PG&E was aware of the conditions of its system. By assigning a yield strength of 52,000 psi to Segment 180 when it did not know the manufacturer's specified minimum yield strength of the pups, PG&E contravened Section 811.27(G) of ASME B31.1.8-1955 and created an unsafe condition in violation of Section 451. This violation occurred in 1956 when Segment 180 was installed.

5.1.7. Wall Thickness

Pups 1, 2 and 3 were partially welded on the longitudinal seam from the outside. The welds did not penetrate through the inside of the pipe, and no inside weld, required for DSAW pipe, was found on the inside of the pipe. According to the NTSB metallurgical examination, the fusion welding process left an unwelded region along the entire length of each seam.

CPSD maintains that this resulted in a reduced wall thickness in the pups in violation of industry standard Section 811.27(C) of ASME B31.1.8-1955. That standard, entitled "Determination of Wall Thickness," states in part that "[u]nless the nominal wall thickness is known with certainty, it shall be determined by measuring the thickness at quarter points on one end of each piece of pipe." PG&E had specified pipe with a 0.375 inch wall thickness but the NTSB found that Pups 1, 2, and 3 had net intact seam thicknesses of 0.162, 0.195, and 0.162 inch, respectively.

CPSD points out that wall thickness is a key component of the design pressure formula in Section 841.1 of ASME B31.1.8-1955, which calculates the safe MAOP for a given pipeline. CPSD notes that the intent of the minimum wall thickness requirement is to ensure its ability to withstand pressure, and that the ability of the pipe to withstand pressure is impacted regardless of whether the wall thickness reduction was on the plate or the seam weld. CPSD concludes that by not completely welding the inside of the longitudinal seams on Pups 1, 2, and 3 of Segment 180 and failing to measure the wall thickness to ensure compliance with the procurement orders which required 0.375-inch wall thickness, PG&E violated Section 811.27(C) of ASME B31.1.8-1955, creating an unsafe system in violation of Section 451.

PG&E claims that Section 811.27(C) of ASME B31.1.8-1955 is inapplicable because it thought it knew the wall thickness of the pups with certainty. We have already addressed PG&E's "improper hindsight" argument and determined that PG&E's lack of knowledge of the conditions of its system does not excuse a safety violation.

PG&E also disputes this alleged violation on the basis of CPSD's interpretation of the standard. PG&E contends that "[w]all thickness is a metric applied to the pipe body" but not the seam. PG&E Opening Brief at 49. Thus, PG&E concludes that the faulty seam welds with thicknesses of half or less the 0.375 inch pipe specification (0.162/0.375 = 43%) did not amount to wall thickness violations.

This dispute turns on the differing interpretations that CPSD's and PG&E's experts have offered regarding the industry standard for wall thickness. CPSD witness Stepanian testified that "the seam weld is considered part of the pipe" (Exhibit CPSD-5 at 7), whereas PG&E witness Harrison testified that "the seam weld itself is considered sort of a unit and is evaluated independent of the wall thickness calculation" (3 Jt. Tr. at 399-400).

It is noteworthy that witness Harrison answered in the affirmative when asked "is it true that the single welded region would be significantly less strong than the intact wall region?" *Id*. at 400: 13-15. We also note that witness Stepanian testified that "[t]he ability of the pipe to withstand pressure is impacted regardless of whether the wall thickness reduction was on the plate or the seam weld." Exhibit CPSD-5 at 7. We find CPSD's interpretation of the wall thickness measurement standard to be more consistent with safe practices than PG&E's interpretation, and we therefore adopt it. Proper measurement of the wall thickness of the pipe is significant because wall thickness is a key

component of the design pressure formula in Section 841.1 of ASME B31.1.8-1955, which calculates the safe operating pressure for a given pipeline. In any event, there is no reasonable argument that PG&E's installation of pipe with only 0.162 inch thickness of the seam weld was safe for the conditions for which the pipe would be operated. We conclude that by not completely welding the inside of the longitudinal seams on Pups 1, 2, and 3 of Segment 180 and then failing to measure the wall thickness to ensure compliance with the procurement orders which required 0.375-inch wall thickness, PG&E violated Section 811.27(C) of ASME B31.1.8-1955, creating an unsafe system in violation of Section 451. This violation occurred in 1956 when Segment 180 was installed.

5.1.8. Girth Weld Quality

The CPSD Report noted that the NTSB found that "the girth welds associated with the [Segment 180] pups had deficiencies related to incomplete fusion, burnthrough, slag inclusion, crack, undercut, excess reinforcement, porosity defects and lack of penetration." Exhibit CPSD-1 at 21; see also *NTSB Metallurgical Group Chairman Factual Report*, Exhibit CPSD-16 at 6. The CPSD Report asserted that these welds did not meet the requirements of Section 811.27(E) of ASME B31.1.8-1955.

PG&E witness Harrison responded to this allegation by asserting that Section 811.27(E) relates to the suitability of pipe for welding prior to use, *i.e.*, weldability, not girth welds made during construction. In CPSD's rebuttal testimony, witness Stepanian withdrew the alleged violation based on CPSD's "incorrect" citation to Section 811.27(E) but maintained that there were girth weld deficiencies associated with the Segment 180 pups. Exhibit CPSD-5 at 7.

CPSD now alleges violations of two industry standards related to its assertion of deficient girth welds on the Segment 180 pups. First, CPSD claims

that by welding the pups in a deficient manner, PG&E violated Section 811.27(E) of ASME B31.1.8-1955, creating an unsafe system in violation of Section 451. Since this is essentially the same allegation that CPSD withdrew in its rebuttal testimony, we do not find it reasonable to revive it at this stage of the proceeding.

Second, CPSD claims that:

> The shoddy and unsafe quality of the welds on the pups indicates the lack of a qualified welder and proper welding techniques. The lack of an inside weld, incomplete fusion, burnthrough, slag inclusion, crack, undercut, excess reinforcement, porosity defects and lack of penetration deficiencies violate the "Standards of Acceptability" in effect at the time, Section 1.7 of API 1104 (4th Ed., 1956), creating an unsafe system in violation of Section 451. The purpose of the industry standards in API 1104 is "to produce the highest quality welds obtainable on a commercial basis by skilled welders…" The poor quality of the welds created an unreasonably unsafe condition. CPSD Opening Brief at 38.

PG&E does not claim that the girth welds on the Segment 180 pup sections were well-made. PG&E witness Dr. Caligiuri, commenting on whether weld porosity can impact weld yield stress and weld fatigue strength, stated that it can do so depending on the level of porosity and that "[t]here are porosities present to some degree in all welds (12 Tr. 1135). Dr. Caligiuri goes on to note that API 1104 provides an accepted standard for evaluating weld porosity. *Id*. at 1135-36. PG&E characterizes Dr. Caligiuri's testimony as stating "there are imperfections in every weld" (PG&E Reply Brief at 43) but that does not appear to accurately reflect the substance of the testimony referenced by PG&E. That testimony appears to be focused on porosity and not on other aspect of weld quality such as incomplete fusion, burn through, slag inclusion, crack, undercut, excess reinforcement, and lack of penetration.

Notwithstanding PG&E's claim that all welds have imperfections, and implication there were no problems with the Segment 180 pup welds, the *NTSB Metallurgical Group Chairman Factual Report* found that the welds had:

> ... various defects including lack of penetration, incomplete fusion, burn through, slag inclusion, crack, porosity, undercutting, and excess reinforcement. All girth welds exhibited incomplete fusion, slag inclusion, and porosity defects on at least one radiograph. Lack of penetration defects were exhibited on all intact girth welds except C1 and C6. Undercutting defects were exhibited on all intact girth welds except C2 and C3. Exhibit CPSD-16 at 6-7.

The Segment 180 pup girth welds were clearly defective in several respects. They did not merely have imperfections common to all welds, as PG&E seeks to suggest.

PG&E notes that "the NTSB Metallurgical Group Chairman stated that API Standard 1104 was a voluntary standard that did not have legal effect until 1961, five years after the installation of Segment 180." PG&E Reply Brief at 43. However, while we look to and rely on the NTSB for technical analysis, we do not rely on the NTSB to interpret and apply Section 451 of the California Public Utilities Code.

The obvious purpose of API 1104, Section 1.7 is to ensure that weld defects are located and repaired or removed. Section 1.7 of API 1104 requires examination for specific defects. The existence of the pup weld defects prohibited by API 1104 strongly suggests that PG&E did not follow either the welding quality requirements or the weld inspection requirements of those guidelines. Section 1.523 of API 1104, which is entitled "Visual Examination," states "The weld must be free of cracks, inadequate penetration, burn-through, and other obvious defects, and it must present a neat workman-like appearance." PG&E should have detected the obviously missing interior weld, and should

have repaired the many defects in the welds before allowing the pups to go into service.

The defective girth welds found by the NTSB on the Segment 180 pups indicate the lack of a qualified welder, lack of proper welding techniques, and lack of any visual examination, in violation of API 1104, creating an unsafe condition that violated Section 451. This violation occurred in 1956 when Segment 180 was installed.

5.1.9. Establishment of Design Pressure and MAOP

Section 845.22 of ASME B31.1.8-1955 requires that the MAOP be established based on the lesser of the design pressure or the test pressure. It also provides that the design pressure is the pressure of the "weakest element of the pipeline or main." CPSD contends that since PG&E could not have relied on a test pressure value, because it has no records showing that there was a pressure test on Segment 180, it should have calculated the design pressure for Segment 180 at the time it was installed and established the MAOP based on that calculation.

CPSD alleges two violations related to the establishment of the Segment 180 MAOP. First, it contends that PG&E did not incorporate the pups, which were the weakest element of Segment 180, when it calculated the design pressure at 400 psi, resulting in an unreasonably high MAOP and thereby creating an unsafe system condition in violation of Section 451. Second, CPSD contends that PG&E lacked complete and accurate knowledge of the specifications or characteristics of the pup that failed, could not have accurately determined the weakest element of the pipeline, and consequently did not know the design pressure of the pups. Therefore, CPSD contends, PG&E did not meet

the MAOP determination requirements in Section 845.22 of ASME B31.1.8-1955, creating an unsafe system condition in violation of Section 451.

PG&E argues that the two MAOP violations alleged by CPSD are duplicative, and we agree. Both pertain to consideration of the design pressure of the weakest element of Segment 180. Moreover, we do not find a significant, bright line distinction between failure to "incorporate the pups … when it calculated the design pressure ... " (CPSD Opening Brief at 39) and failure to have "complete and accurate knowledge of the specifications or characteristics of the pup that failed" (*id*.) adequate to justify two distinct allegations. We therefore combine and consider them as one alleged violation.

PG&E argues that CPSD's MAOP allegations are "based on hindsight knowledge no one had in 1956." PG&E Opening Brief at 56. However, as previously discussed, CPSD is not required to prove PG&E's mental state at time the violation occurred, and it does not have to prove that PG&E actually knew about the flawed pup sections when it calculated MAOP.

PG&E argues that the MAOP of 400 psi for Segment 180 was correct based on the assertion that "[a]pplying the design formula to that [32,000 psi] tensile strength, the 1956 MAOP would have been 480 psig in a Class 2 location and 400 psig in a class 3 location." PG&E Opening Brief at 56. However, the NTSB found that the MAOP of 400 psi was incorrect:

> Based on the yield strength test data, the MAOP for a class 3 location would have been 284 psig and the MAOP for a class 2 location (as the location of Segment 180 was in 1956) would have been 341 psig. Exhibit CPSD-9 at 106.

CPSD's expert witness calculations for MAOP similarly found the MAOP was incorrect:

> If PG&E had used the 24,000 value for the yield strength on the pipe, it would have had an MAOP of 300 psi if the type of longitudinal seam was known. If they did not have records on the type of seam, it should have used a joint seam factor of 0.8 which would have lowered the MAOP to 240 psi, well below the actual pressure at which Segment 180 failed. Exhibit CPSD-5 at 18.

We are not persuaded that PG&E's testimony overcomes the calculations of the NTSB's and CPSD's engineers that the MAOP of 400 would have been too high based on the actual conditions of the pups that PG&E installed. As CPSD points out, for PG&E to calculate a higher MAOP than either the NTSB or CPSD, it must have not only assumed 32,000 psi for yield strength instead of 24,000, but also a 0.375 inch nominal wall thickness even though this ignores the missing seam of the defective longitudinal seam weld. The evidence does not show that the pups were constructed to survive pressures as high as 400 psi, and a rupture in fact occurred at only 386 psi. Moreover, the design calculation for MAOP builds in a safety factor. If the pipe as constructed will fail at 386 psi, the MAOP, if calculated correctly, will be substantially lower to ensure the failure threshold is not approached. Thus, by failing to properly account for the actual condition, characteristics, and specifications of the pups, such as the missing seam welds, when it established MAOP, PG&E failed to comply with Section 845.22 of ASME B31.1.8-1955. It thereby created an unsafe condition in violation of Section 451. This violation occurred in 1956 when Segment 180 was installed.

5.1.10. Unsafe Condition of Segment 180

CPSD alleges three violations that, broadly speaking, pertain to the overall unsafe condition of Segment 180 when it was constructed in 1956. Because these allegations pertain to the violations discussed above, and because PG&E argues that they are duplicative, we discuss them together here.

First, CPSD alleges that PG&E failed to follow industry safety standards during the construction of Segment 180 in 1956, creating an unreasonably unsafe system in violation of Section 451. Second, CPSD alleges that by installing pipe sections (pups) in Segment 180 that did not meet any known industry specifications for fabrication of gas transmission pipe, PG&E created an unreasonably unsafe system in violation of Section 451. Third, CPSD alleges that PG&E violated Section 451 when it failed to comply with Section 810.1 of ASME B31.1.8-1955. That standard requires the use of suitable and safe materials:

> It is intended that all materials and equipment that will become a permanent part of any piping system constructed under this code shall be suitable and safe for the conditions under which they are used. All such materials and equipment shall be qualified for the conditions of their use by compliance with certain specifications, standards, and special requirements of this code or otherwise as provided herein.

We concur with PG&E that there is significant overlap in the framing of these three violations. All three point to the unsafe condition of Segment 180 that resulted from the failure of PG&E to follow industry standards, as discussed above. The first allegation pertains to industry standards; the second pertains to industry specifications, which are components of standards; and the third pertains to suitability and safety of materials for the conditions in which they are used, which also relates to the previously discussed standards. We do not find distinctions that warrant findings of separate and distinct violations, and we therefore consider them as one alleged violation.

As we discussed above, PG&E's installation of the pups in Segment 180 did not comply with industry safety standards in several respects. The pups were not properly pressure tested, were not visually inspected, did not meet

minimum length standards, were assigned yield strength of 52,000 psi when that value should have been 24,000 psi because the manufacturer's specification was unknown, had inadequate wall thickness due to missing interior seam welds, and had other welding defects. Moreover, MAOP was set dangerously high for the poor quality of the Segment 180 pups. Thus, the Segment 180 pups were demonstrably not suitable or safe for the conditions under which they were used.

PG&E takes issue with any suggestion that Section 810.1 of ASME B31.1.8-1955 imposes a "general duty of reasonable care," noting that the terms "duty" and "reasonable care" do not appear in the standard. We note that determination of the violation alleged by CPSD does not require resolution of this argument. The duty we are concerned with pertains to the utility safety obligation created by Section 451.

As TURN notes (TURN Opening Brief at 14), PG&E witness Harrison testified that if PG&E had known about the missing interior welds on the Segment 180 pups, it would have immediately "yank[ed] that pipe out of the ground." 3 Jt. Tr. 337-338. And as TURN further notes, that amounts to an admission that for 54 years, PG&E operated an unsafe pipeline in violation of Section 451. TURN Opening Brief at 14.

By installing pipeline sections in Segment 180 out of compliance with industry standards and specifications, and not suitable or safe for the conditions under which they were used, contrary to Section 810.1 of ASME B31.1.8-1955, PG&E created an unreasonably unsafe system in violation of Section 451. The unsafe condition was created by PG&E in 1956 when the pipe was installed, and it persisted uncorrected each day thereafter, until the resulting disaster of September 9, 2010, in continuing violation of Section 451.

5.2. PG&E's Integrity Management Program

5.2.1. Overview

PG&E's integrity management program was built upon the company's previously existing Risk Management program. Exhibit PG&E-1C at 4-2. The Risk Management program, developed beginning in 1998 to mitigate risk across the company's pipeline system, analyzed all pipeline segments operating above 60 psig, and it performed a relative risk assessment that ranked each pipe segment based on a formula that took into account the likelihood and consequences of failure. *Id*. at 4-3. PG&E has adopted a series of RMPs, one of which, RMP-06, sets forth the framework of the company's integrity management program. *Id*. at 4-3, 4-4. PG&E formally implemented its integrity management program in December 2004 with the filing of its initial Baseline Assessment Plan (BAP). *Id*. at 4-4. The BAP listed all segments in the company's gas transmission network that were within the scope of the federal rules, and it outlined the assessment method to be employed for each segment. *Id.*

CPSD contends that PG&E did not comply with integrity management requirements of 49 CFR 192, Subpart O (49 CFR 192.901, *et seq*.), including data gathering and integration, threat identification, and risk assessment requirements.[34] For consistency and clarity, in Section 5.2 of this decision we generally follow CPSD's categorization of alleged integrity management violations according to these three topics. CPSD alleges 15 violations of integrity

[34] Requirements for data gathering and integration, threat identification, and risk assessment are set forth in 49 CFR 192.917(b), 49 CFR 192.917(a), and 49 CFR 192.917(c), respectively.

management and related laws, the majority of which are alleged as Subpart O violations. All are alleged as violations that continued until September 9, 2010.

PG&E does not concede that it violated any of the safety laws cited by CPSD in the operation of its integrity management program. PG&E also disputes CPSD's allegations of continuing integrity management violations.

CPSD's allegations of integrity management violations may be particularly significant. To the extent that the underlying facts are proven, PG&E's practices would have resulted in missed opportunities for PG&E to detect and correct the unsafe conditions that it created in Segment 180.[35] The NTSB determined that PG&E's "inadequate pipeline integrity management program, which failed to detect and repair or remove the defective pipe section," was one of two probable causes of the San Bruno explosion (the other being "inadequate quality assurance and quality control in 1956 during its Line 132 relocation project"). Exhibit CPSD-9 at xii. We also note that the IRP Report found that PG&E's integrity management program suffered from ineffective executive leadership (Exhibit CPSD-10 at 72) "inadequate quality control and quality assurance management" (*id*. at 73) and generally had "numerous shortcomings" (*id*. at 7).

5.2.2. General Integrity Management Issues

5.2.2.1. Effective Date of the Integrity Management Rule

Notice of the new federal integrity management rule, 49 CFR 192, Subpart O, was provided on December 15, 2003. CPSD alleges that 10 continuing integrity management violations began on that date. PG&E points out that while

[35] However, as noted earlier (see Section 4.1 above), this decision is focused more on determining whether PG&E violated gas transmission safety laws than on the root cause of the San Bruno explosion and fire.

the rule was noticed on December 15, 2003, the date it was published in the Federal Register, it became effective on February 14, 2004.[36] Additionally, as CPSD notes (Exhibit CPSD-1 at 43), 49 CFR 192.907(a) provides that "[n]o later than December 17, 2004, an operator of a covered pipeline segment must develop and follow a written integrity management program that contains all the elements described in § 192.111 and that addresses the risks on each covered transmission pipeline segment."

CPSD has not shown why we should, or how we could, find that violations of 49 CFR 192, Subpart O occurred prior to that rule's becoming effective. Moreover, CPSD has not shown that it is reasonable to find violations of Subpart O occurring before the date an operator was required to have an integrity management program in place and follow it. Accordingly, we will not find violations of Subpart O occurring prior to December 17, 2004.

5.2.2.2. Integrity Management Audits

PG&E's integrity management witness Keas testified that PG&E's data gathering and integration processes were the subject of three PHMSA and/or CPSD audits prior to September 2010 that did not did not identify shortcomings in this area. Exhibit PG&E-1C at 4-11. Ms. Keas stated that CPSD's "review and lack of criticism of our data gathering and integration processes with respect to manufacturing and construction threats in the May 2010 audit stands in contrast to CPSD's post-San Bruno allegations regarding the same processes." *Id*. at 4-12.

---

[36] The integrity management rule was promulgated by OPS on December 15, 2003, by publication in the Federal Register (FR) of that date, with an effective date of January 14, 2004. 68 FR 69,778. The effective date was later changed to February 14, 2004 to meet the 60 day requirement for Congressional review of major rules (5 U.S.C. 801(a)(4)). 69 FR 2,307.

CPSD witness Stepanian testified in rebuttal that no audit can detect every violation, and that:

> These audits are not intended to examine every detailed aspect of a utility's system and find every possible violation. Ultimately, the responsibility for compliance with the rules rests with the utility, and the utility is accountable for violations existing on its system. Exhibit CPSD-5 at 5.

He went on to explain that:

> PG&E's claim is like a reckless driver exceeding the speed limit on the freeway and arguing that he/she should not receive a ticket because he/she has exceeded the speed limit previously and the CHP did not cite him/her at that time. It is simply impractical to assume that the CHP is able to prevent all drivers from speeding at all times. Similarly, it is impractical for CPSD to prevent PG&E from violating all safety rules at all times. The number of records reviewed and the number of facilities inspected in the field at any point in time are fractions of the total number of records available and facilities in a typical distribution division or a transmission district. CPSD cannot continuously monitor the thousands of PG&E designers, crews, engineers, excavators, dispatchers and all other employees associated with its physical system. *Id.* at 5-6.

Mr. Stepanian further explained that an integrity management audit is largely a "procedures focused audit" (*id*. at 18) similar to an Operations, Maintenance and Emergency Plan audit, which is also a procedures-based audit, and that such an audit might find procedural compliance even though there are underlying violations. *Id.* at 18-19. Thus, as Mr. Stepanian testified, PG&E's integrity management procedures may similarly be in conformance with PHMSA protocols and yet there may be instances where the data gathering and integration process fall short, in violation of code requirements. *Id*. at 19.

While it is unfortunate that CPSD and PHMSA audits did not uncover deficiencies in PG&E's integrity management practices that have now been

discovered, it does not appear likely that such audits could have uncovered all violations of safety laws, nor could they reasonably be expected to have done so. PG&E witness Keas may be correct that the results of CPSD's extensive investigation in this proceeding, following an in-depth NTSB investigation, stand in contrast to the results of earlier CPSD and PHMSA audits. However, CPSD has explained why that is not surprising. Moreover, the fact that CPSD/PHMSA audits did not uncover the violations now at issue in this proceeding is not relevant to the question of whether a violation occurred. We reject any suggestion that the findings of the CPSD and PHMSA audits excuse any deficiencies or violations in PG&E's integrity management practices. An audit that fails to find a safety violation does not absolve PG&E of responsibility and accountability for that violation.[37]

5.2.2.3. Industry Practices

Responding to the CPSD's discussion of problems with PG&E's GIS data, PG&E witness Keas testified that "it was common industry practice to accept the accuracy of prior data gathering efforts unless there was specific information calling it into question." Exhibit PG&E-1C at 4-12. Downplaying the threat posed by cyclic fatigue on natural gas pipelines, PG&E's cyclic fatigue witness Kiefner discussed industry practices concerning the threat, stating that "the industry expectation has long been that other threats such as corrosion and third party damage pose far greater challenges to natural gas pipeline safety than does cyclic fatigue." Exhibit PG&E-1 at 6-7.

[37] Additionally, as we determined in Section 4.8 of this decision, the doctrine of laches does not bar CPSD from bringing this enforcement action against PG&E.

We reject any suggestion that an operator may be excused from complying with integrity management rules provided that it is following a consensus industry practice or industry expectation, even where that practice has the support of industry experts. The relevant inquiry here is whether PG&E violated safety laws, not whether PG&E's integrity management practices were similar to those of its industry peers, and not whether adopted regulations reflected industry consensus or preference.[38] As Mr. Zurcher agreed, industry practices are not an excuse for violating the law. 7 Jt. Tr. 715.

5.2.3. Alleged Data Gathering and Integration Violations

5.2.3.1. Introduction

Requirements for data gathering and integration are set forth in 49 CFR 192.917(b), which states:

> *Data gathering and integration*. To identify and evaluate the potential threats to a covered pipeline segment, an operator must gather and integrate existing data and information on the entire pipeline that could be relevant to the covered segment. In performing this data gathering and integration, an operator must follow the requirements in ASME/ANSI B31.8S, section 4. At a minimum, an operator must gather and evaluate the set of data specified in Appendix A to

[38] Mr. Kiefner testified that "much of the language in the natural gas pipeline regulations mirrors that in the liquid pipeline regulations despite key differences between the two subjects, such as the relative threat posed by cyclic fatigue." Exhibit PG&E-1 at 6-6. However, to borrow from Mr. Stepanian's speeding car analogy, if the maximum speed limit for a segment of highway were set at 55 mph, and an expert traffic safety study showed that the speed limit could safely be increased to 65 mph, a vehicle operator would nevertheless be bound to obey the 55 mph limit until and unless the highway authorities accepted the study and raised the limit. Even if cyclic fatigue was not believed by some to be the highest priority threat to be considered by natural gas pipeline operators, it would be up to PHMSA to promulgate rules that reflect that view, not for an operator like PG&E to interpret the rule as if it did not apply.

> ASME/ANSI B31.8S, and consider both on the covered segment and similar non-covered segments, past incident history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, internal inspection records and all other conditions specific to each pipeline.

PG&E's pre-San Bruno data gathering process consisted of two steps. Exhibit PG&E-1C at 4-7 to 4-8. First, it reviewed centralized pipeline data, integrated with other geographic and surrounding environment data to determine which threats were present on each HCA segment. *Id.* at 4-7. Second, it obtained additional information from locally-stored and archived pipeline records and interviews with pipeline engineers and field personnel. *Id.* at 4-8. For the initial creation of its 2004 BAP, PG&E's data gathering process collected pipeline attributes from available, verifiable information or information that could be obtained in a timely manner, such as from GIS. *Id*. at 4-7.

CPSD contends that potential threats to the integrity of pipe can only be identified through a detailed and thorough knowledge of each covered segment. TURN argues that an integrity management program "based on incorrect records that neither the operator nor regulator know about provides a false sense of security and therefore is probably more harmful than beneficial to pipeline safety." TURN Opening Brief at 17. As the NTSB explained, "accurate, complete, and verifiable data" are elements of an effective integrity management program (Exhibit CPSD-9 at 107), and "[t]he foundation of risk assessment is accurate information" (*id*. at 110).

CPSD alleges 4 violations in connection with its discussion of data gathering and integration requirements. These allegations are addressed in Section 5.2.3.2 through Section 5.2.3.5 below.

5.2.3.2. Use of Conservative Assumptions

Appendix A to ASME/ANSI B31.8S sets forth the data sets required for the integrity management process, including pipe material, year of installation, pipe manufacturing process, seam type, joint factor, and operating pressure history. The rule provides that where there is missing data, "conservative assumptions should be used." Exhibit CPSD-1 at 28.

The CPSD Report discusses two practices where, it contends, PG&E failed to use conservative assumptions. Exhibit CPSD-1 at 31. First, PG&E used three different values for the SMYS of Grade B steel—35,000 psi, 40,000 psi, and 45,000 psi. *Id*. CPSD witness Stepanian believes that API Grade B pipe has a minimum yield strength of 35,000 psi. Exhibit CPSD-5 at 15. Second, two Line 132 segments[39] with unknown SMYS were assigned non-conservative values of 33,000 psi and 52,000 psi even though 49 CFR 192.107(b)(2) requires a conservative value of 24,000 psi when the exact SMYS of a pipe segment is not known or documented. Exhibit CPSD-1 at 31.

Based on this fact pattern, CPSD alleges that PG&E violated ASME-B31.8S, Appendix A, Section 4.2, by failing to use conservative assumptions where PG&E was missing important pipeline data such as pipe material, manufacturing process, and seam type.[40] CPSD alleges this as a continuing violation that ran

---

[39] The integrity management summary section of the CPSD Report discusses deficiencies in PG&E's data gathering and integration processes on Line 132 segments. Exhibit CPSD-1 at 26. Thus, it is clear that CPSD is referring to Line 132 segments.

[40] In Appendix B to its opening brief, proposed conclusion of law 27 at 4, CPSD alleges PG&E's failure to use conservative assumptions as a violation of ASME-B31.8S Appendix A, Section 4.2. Since 49 CFR 192.917(b) requires that an operator must gather and evaluate the set of data specified in Appendix A to ASME/ANSI B31.8S, this would constitute a violation of 49 CFR 192.917(b). However, in Revised Appendix C to its

Footnote continued on next page

from December 15, 2003 to September 9, 2010. PG&E disputes this allegation on several grounds.

PG&E maintains that it made conservative assumptions regarding pipe characteristics based on its procurement history. Exhibit PG&E 1-C at 4-10. For example, PG&E notes, its practice where it was missing data was to use the lowest SMYS value based on its material procurement specifications for pipelines installed during the same time period. *Id*. at 4-9. We are not persuaded that PG&E's practice of relying on those specifications was always conservative. As CPSD witness Stepanian explained,

> [I]f a company can demonstrate via exhaustive research that they have uncovered every type of pipe purchased that could have been used on the subject installation (this includes new and used pipe of an older vintage), then CPSD would agree that using the lowest quality material procurement specification during the time frames in question would reflect all of the possible pipe that could have been place in service for the specific segments in question. If not, this is not a good utility practice. Exhibit CPSD-5 at 18.

With respect to the requirement to use a conservative SMYS value of 24,000 psi, PG&E witness Zurcher testified that the requirement applies only where the operator has *no* information. 1 Jt. Tr. 28-9. However, as CPSD notes, 49 CFR 192.107(b)(2) requires operators to use 24,000 psi if the required data are

---

opening brief (at 4), CPSD alleges this as a violation of Section 451. CPSD's discussion of this topic notes that ASME B31.8S is incorporated in 49 CFR 192.917(b) but does not mention Section 451. CPSD Opening Brief at 41. Also, CPSD apparently intended to charge this as a violation of 49 CFR 192.917(b) because it alleged it as a continuing violation that began with what it believed to be the effective date of 49 CFR 192 Subpart O. Further, CPSD does not explain why it alleged this as a Section 451 violation in Revised Appendix C. Accordingly, we disregard CPSD's reference to Section 451 in connection with this alleged violation.

missing. It would be unreasonable to conclude that an operator's integrity management practice could be based on a "conservative assumption" that violates other provisions of Title 49.

With respect to CPSD's understanding that Grade B pipe has a minimum SMYS of 35,000 psi, and the resulting conclusion that use of higher SMYS values would not be conservative, PG&E witness Zurcher testified that while a SMYS of 35,000 psi is common, Grade B pipe is also available at intermediate grades above that value. 1 Jt. Tr. 53. However, even though Grade B pipe may be available with SMYS greater than 35,000 psi, we are not persuaded that it would be conservative to assume that a piece of Grade B pipe has a higher SMYS.

PG&E argues that CPSD's reliance on PG&E's use of a yield strength greater than 24,000 psi to support this alleged violation duplicates CPSD's other alleged violations relating to assumed SMYS values greater than 24,000 psi. PG&E Opening Brief, Appendix E at E-23. As alluded to earlier (Section 5.1.6 above), the practice cited by CPSD in support of this alleged violation is similar to CPSD's alleged violation that PG&E violated 1956 industry standards by assigning a yield strength above 24,000 psi on Segment 180, a violation that we have upheld. Nevertheless, we do not find the alleged violations to be duplicative. The 1956 violation is separate and distinct from a violation of integrity management requirements that became effective decades later. Also, this is just one of two of PG&E's practices relied on by CPSD to support its allegation of a "conservative assumptions" violation; CPSD also relies on PG&E's practice with respect to Grade B pipe. In the following section (Section 5.2.3.3), we address CPSD's allegation that PG&E violated 49 CFR 192.107(b)(2), by not assigning a yield strength of 24,000 psi when the yield strength was unknown and untested. Again, we do not find that that alleged violation, which is not a

Subpart O violation, duplicates a violation regarding conservative assumptions for integrity management purposes.

The preponderance of evidence shows that PG&E failed to use conservative assumptions as required by the integrity management regulations. Accordingly, we find that PG&E violated ASME-B31.8S, Appendix A, Section 4.2, and therefore 49 CFR 192.917(b), by failing to use conservative assumptions where PG&E was missing important pipeline data such as pipe material, manufacturing process, and seam type. There is no evidence this violation was remediated prior to the San Bruno explosion and fire. We therefore find that this violation continued from December 17, 2004 to September 9, 2010.

5.2.3.3. 49 CFR 192.107 Yield Strength Requirements

CPSD notes that 49 CFR 192.107(b)(2), which deals with pipe design pressure requirements, requires operators to use a yield strength of 24,000 psi if the data is missing and the pipe is not tensile tested. CPSD alleges that by routinely using yield strength values above 24,000 psi, PG&E violated 49 CFR 192.107(b)(2). CPSD alleges this as a continuing daily violation, running from August 19, 1970, the effective date of the federal pipeline safety rules in 49 CFR 192, through September 9, 2010. This alleged violation pertains to requirements for the calculation of design pressure, not integrity management requirements.

CPSD does not refer us to evidence proving that beginning in 1970, PG&E routinely assigned yield strength values above 24,000 psi. We cannot make the requisite findings of fact to uphold this alleged violation, and we therefore reject it.

5.2.3.4. Missing and Inaccurate Data

5.2.3.4.1. GIS

One of the main tools used by PG&E for analyzing integrity management data is its GIS, a computer system capable of capturing, storing, managing, analyzing, and displaying geographically referenced information. Exhibit CPSD-1 at 29, 63. PG&E began developing its GIS system in the mid-1990's. *Id.* at 63. It linked pipe specifications of its gas transmission pipelines to GIS, and transferred data from PLSSs into the database, a process that was completed over several years. *Id.* It allows for visual review of pipelines, and allows the reviewer to correlate the pipeline with geographic features such as roads, buildings, and other information about the surrounding environment. Exhibit PG&E-1C at 4-4, footnote 4. The NTSB Report notes that PG&E reported that the GIS was fully populated in 1998. Exhibit CPSD-9 at 60. If information was missing, assumed values were entered along with an indicator (negative sign) of assumed values. *Id*.

5.2.3.4.2. The Alleged Violation

Asserting that failure to accurately gather and integrate required pipeline data is a violation of 49 CFR 192.917(b), CPSD alleges that there were numerous examples of missing or inaccurate data in PG&E's records. CPSD asserts as data deficiencies (CPSD Opening Brief at 42) the following eight examples where NTSB investigators, who reviewed GIS data and PLSSs for Line 132 to determine how often assumed or unknown values were entered (Exhibit CPSD-9 at 60-61), found that:

- The pipe wall thickness was an assumed value for 21.5 miles (41.75 percent) of Line 132;
- The manufacturer of the pipe was unknown ("NA") for 40.6 miles (78.81 percent) of Line 132;

- The pipeline depth of ground cover was also unknown for 42.7 miles (82.79 percent) of Line 132;
- Three values were used for the SMYS of grade B pipe: 35,000 psi, 40,000 psi, and 45,000 psi;
- Two segments with unknown SMYS were assigned values of 33,000 psi and 52,000 psi, not 24,000 psi;
- Six consecutive segments, totaling 3,649 feet, specified an erroneous minimum depth of cover of 40 feet;
- Several segments, including Segment 180, specified 30-inch diameter seamless pipe, although there was no API-qualified domestic manufacturer of such pipe when the line was constructed;
- The GIS did not reflect the presence of the six pups in Segment 180.

Based on these and other examples of asserted data inaccuracies and omissions, CPSD alleges that PG&E violated 49 CFR Part 192.917(b) by not adequately gathering and integrating required pipeline data, thereby not having an adequate understanding of the threats on Line 132. CPSD alleges that this violation continued from December 15, 2003 to September 9, 2010.

5.2.3.4.3. Data Quality and Accuracy

Data quality and accuracy are of fundamental importance in any analysis of the potential threats to a pipeline segment. Exhibit CPSD-1 at 28. Because an effective integrity management program is dependent upon an operator's knowledge of its system in order to identify and evaluate potential threats, and 49 CFR 192.917(b) explicitly provides a process for data gathering and integration for this purpose, it is clear that the data used by the operator to identify and evaluate threats needs to be reliably accurate. Incomplete,

inaccurate, and inadequately integrated data can result in a violation of 49 CFR 192.917(b).

PG&E is concerned that "[t]o accept CPSD's position [regarding PG&E's erroneous identification of 30-inch seamless pipe] is to conclude that *any single data error* among several millions of data entries constitutes a violation of law. PG&E Opening Brief at 70, emphasis in original. However, the opposite conclusion—that the presence of erroneous data is of no legal consequence—is both untenable and contrary to what the Commission has held. In *In Re: Investigation into Southern California Edison Company's Electric Line Construction, Operation, and Maintenance Practices*, the "fundamental underlying dispute" between CPSD and Edison was the issue of whether failure to comply with any provision of any of the Commission's GOs is a violation that could subject Edison to penalties. D.04-04-065 at 4. CPSD alleged that Edison violated GO 95 on 4,044 occasions. *Id*. at 5. Edison argued that holding it responsible for each violation was "unprecedented and counterproductive" and would lead to exorbitant costs. *Id*. Instead, Edison argued, failure to comply with the GOs in the first instance should be considered only a "nonconformance" or "variance" with the GOs. The Commission rejected that argument, finding that utilities are required to comply with relevant safety statutes, Commission GOs, and decisions. *Id.* at 62, Conclusion of Law 3. The Commission stated: "If a utility fails to comply with a GO, it is violating that GO." *Id*. at 63, Conclusion of Law 4. The Commission also held that the fact that a utility has limited resources "does not eliminate the existence of a violation but may be a factor in assessing penalties." *Id.*, Conclusion of Law 6. Because the data gathering and integration mandate cannot be fulfilled with inaccurate data, the presence of inaccurate data in the GIS system can result in a violation of 49 CFR 192.917(b).

CPSD witness Stepanian described three examples from the NTSB Report as examples of erroneous GIS data: (1) indicating 40 foot depth of cover, (2) showing pipe as seamless, and (3) not reflecting the six Segment 180 pups. Exhibit CPSD-1 at 32. With respect to the first, PG&E believes that the reference to six segments with a 40 feet depth of cover in the NTSB Report is a "simple data entry error" since 4.0 feet is a common depth of cover. PG&E Opening Brief at 68, footnote 352. Those depth-of-cover errors may be simple but we are not prepared to dismiss them as unimportant. On the other hand, CPSD has not persuaded us that the fact that PG&E's GIS did not reflect the presence of the defective Segment 180 pups is a data gathering and integration error.

With respect to the admittedly erroneous GIS data showing several Line 132 segments, including Segment 180, as 30-inch diameter seamless pipe, PG&E witness Keas suggests that such errors are (1) excusable due to the age of the data, (2) consistent with industry practice, and (3) of little consequence. First, she notes that "due to the passage of time between the 1956 construction and implementation of integrity management rules in 2004, [PG&E's] Integrity Management engineers did not identify the segment as requiring additional records research." Exhibit PG&E-1C at 4-12. She goes on to state that "operators did not interpret the integrity management rules as mandating that they recreate pipeline data from scratch, and it was common industry practice to accept the accuracy of prior data gathering efforts unless there was specific information calling it into question." *Id.* Witness Keas goes further to state that even if PG&E had identified that 30-inch seamless pipe was an incorrect specification, additional research would have shown that Segment 180 was constructed with DSAW pipe. *Id*. However, according to Keas, correct identification of DSAW pipe would not have caused PG&E to consider the segment subject to a

manufacturing threat, or changed any other element of its risk and threat assessment. *Id.* She concludes that "[i]n short, the erroneous seamless designation did not have any effect on the threat identification or integrity assessment method we chose for Segment 180." *Id*.

However, as CPSD witness Stepanian testified, although it may not be necessary to recreate pipeline data from scratch, it is necessary that data be checked for accuracy to comply with ASME B31.8S, Section 5.7(e). Exhibit CPSD-5 at 19. That standard explicitly provides that any data applied in a risk assessment process shall be verified and checked for accuracy. Also, we find troubling PG&E's position that the presence of inaccurate seam type data in its GIS was excusable because, as it happened, the threat identification process would have yielded the same result if the correct designation of DSAW had been in PG&E's records. Even if that were true, which is at best arguable,[41] such a fortunate happenstance would not justify the presence of inaccurate data and excuse PG&E from complying with 49 CFR 192.917(b). Also, as discussed earlier, we do not accept the practices of other operators as an excuse for violations of safety laws.

5.2.3.4.4. Leak Data

CPSD describes another data gathering and integration deficiency in PG&E's failure to gather all relevant leak data on Line 132 and integrate it into the GIS. Exhibit CPSD-1 at 26. Notwithstanding PG&E's claim that ASME B31.8S Appendix A, Section 4.2 does not require operators to review leak

[41] CPSD witness Stepanian shows that identification of Segment 180 as DSAW instead of the incorrect seamless designation should have led to assumption of a manufacturing threat. Exhibit CPSD-5 at 20.

records for purposes of determining the potential for a manufacturing threats (Exhibit PG&E-1C at 4-14), 49 CFR 192.917(b) requires operators to consider "past incident history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, internal inspection records and all other conditions specific to each pipeline." Moreover, 49 CFR 192.907(b) provides that "[i]n the event of a conflict between this subpart and ASME/ANSI B31.8S, the requirements in this subpart control."

PG&E claims that even though leak data was missing from its GIS, it maintained leak records in hard copy form kept in leak libraries at approximately 70 field offices. PG&E notes that GIS is a tool that allows data integration (Exhibit PG&E-1C at 4-7), but it does not adequately explain how having leak data scattered in hard copy across its operations would constitute *gathering* and *integration* of data.[42] Moreover, failure to integrate leak data into the GIS system would appear to be inconsistent with PG&E's own stated policy.[43] PG&E's failure to gather and integrate leak data is further evidence of the company's noncompliance with the data gathering and integration requirement.

5.2.3.4.5. Two-Step Implementation

With respect to data gathering, under the heading "Data Elements Selected for Initial Analysis," PG&E's RMP-06 provides in part that:

---

[42] PG&E notes that its procedures call for gathering leak information in the second step of its data gathering process. PG&E Opening Brief at 65. Section 5.2.3.4.5 below addresses PG&E's contention that it gathers and integrates data in a two-step process.

[43] PG&E's RMP-06 provides that "[c]omprehensive pipeline and facility knowledge are essential to understanding the risk drivers that can affect an HCA. No one source of information is sufficient to make a reasonable assessment of risk; therefore, this information is gathered from numerous sources and has been integrated into the Company's GIS system." Exhibit PG&E-6, Exhibit 4-6 at 20.

> For the risk analysis process, the Company has chosen pipeline attributes based upon available, verifiable information or information that can be obtained in a timely manner. Exhibit PG&E-6, Exhibit 4-6 at 22.

Under the heading "Data for Future Analyses" RMP-06 goes on to provide in part that:

> Data integration for integrity management is an ongoing process. After the initial risk analysis and threat identification is made, re-analysis will be made on an annual basis. *Id.*

CPSD asserts that PG&E's policy of using data that can be obtained in a timely manner, in lieu of thorough data gathering and integration, is contrary to the requirements of 49 CFR 192.917 (b) and ASME B31.8S. Exhibit CPSD-1 at 30.

PG&E maintains that it implemented the data gathering and integration process properly in the second data gathering step described above even as it essentially concedes that certain data "were not readily gathered and integrated into GIS" in the first step. PG&E Opening Brief at 63. PG&E witness Keas explained the process as follows:

> [T]he data collection process … happens at least on an annual basis. And so at some point you would have to complete your analysis for that given time period with the understanding that data is continuing to come in and that we would pick it up on the next analysis cycle. 10 Jt. Tr. 1076: 18-24.
>
> * * *
>
> [W]e attempt to use all the data that is available to us at the time, but certainly other data can come in over the next year that we would have to incorporate that new information. *Id*. at 1077: 4-8.

Witness Keas has explained that PG&E updates its data annually to incorporate new data into its integrity management process but this does not adequately explain or justify inaccurate and missing data in GIS. As CPSD witness Stepanian stated, as a result of PG&E's limiting its data gathering to that

which could be obtained in a timely manner, "an in-depth understanding of the threats on Line 132 and Segment 180 was not achieved." Exhibit CPSD-1 at 30.

PG&E's "two-step" approach to data management does not justify noncompliance with the data gathering and integration of 49 CFR 192 Subpart O, even if, as PG&E witness Zurcher testified (8 Jt. Tr. 797-798), PG&E's practice lined up with those of 50 to 60 other companies. The evidence of missing data for Line 132, such as wall thickness, depth of ground cover, manufacturer, seam type, pressure testing, yield strength value, shows that that PG&E failed to adequately gather and integrate existing data. Additionally, ASME B31.8S, Section 5.7 (e) provides that "[a]ny data applied in a risk assessment process shall be verified and checked for accuracy."

5.2.3.4.6. Conclusion - Missing and Inaccurate Data

In view of the inaccuracies and omissions in PG&E's GIS discussed above, PG&E violated 49 CFR 192.917(b) by not adequately gathering and integrating required pipeline data, thereby not having an adequate understanding of the threats on Line 132. PG&E's GIS was fully populated in 1998. By the time that PG&E's integrity management program was implemented six years later, it should have included reliably complete and accurate data but did not always do so. PG&E's integrity management program was continuously subject to incomplete and inaccurate data. Accordingly, we find that this violation continued from December 17, 2004 to September 9, 2010.

5.2.3.5. Data Checking and Verification

CPSD alleges that by failing to check for and verify the accuracy of its pipeline data, PG&E violated Section 5.7 of ASME B31.8S, which is incorporated

by reference into 49 CFR 192. CPSD alleges this as a continuing violation that ran from August 19, 1970 to September 9, 2010.

CPSD's brief discusses this alleged violation in broad terms and refers to PG&E's policy of relying on timely available data, but it does not otherwise identify the evidence it relies upon to support this allegation. PG&E's noncompliance with Section 5.7 supports CPSD's alleged violation of other integrity management requirements (see Section 5.2.3.4 above), but CPSD has not justified assessment of an additional, stand-alone violation of 49 CFR 192 dating back to 1970. Accordingly, we do not sustain this alleged violation

5.2.4. Alleged Threat Identification Violations

5.2.4.1. Introduction

Requirements for threat identification are stated in 49 CFR 192.917(a), whose key provision is that "[a]n operator must identify and evaluate all potential threats to each covered pipeline segment." The rule also provides that the potential threats an operator must consider include those listed in ASME/ANSI B31.8S, incorporated by reference in 49 CFR 192. ASME-B31.8S Section 2.2 states in part that "[t]he first step in managing integrity is identifying potential threats to integrity. All threats to pipeline integrity shall be considered." 49 CFR 192.917(e) further addresses required actions for identified threats.

The CPSD Report explains that ASME-B31.8S provides for a performance based and a prescriptive process, and that PG&E follows the latter. Exhibit CPSD-1 at 36. ASME B31.8S, Section 2 identifies three threat categories -- time dependent, stable, and time independent -- with three threats in each category. *Id.* Added to these nine threats are cyclic fatigue and other loading conditions, and all other potential threats that may not be included in one of the

other categories (such as unknown threats). *Id.* All threats need to be considered, and the plan must include justification for the elimination of a threat if data demonstrates that the threat does not exist. *Id.* Also, the interactive nature of threats must be considered. *Id.*

CPSD alleges 7 violations of, or related to, the threat identification requirements of the integrity management regulations. These are addressed in Section 5.2.4.2 through Section 5.2.4.5 below.

5.2.4.2. Seam Weld Defects

5.2.4.2.1. The Alleged Violation

The NTSB Report discusses the history of seam defects in PG&E's gas transmission pipelines. Exhibit CPSD-9 at 38-39. One example is a longitudinal seam leak on Line 132 in October 1988, 8.78 miles south of the San Bruno rupture. *Id*. at 38. PG&E's GIS listed the leak's cause as "unknown" until after the rupture. *Id*. A leak survey inspection and repair report dated October 27, 1988 classified the cause of the leak as a "material failure" and indicated that a material failure report was prepared but PG&E could not locate such a report. *Id*. Records showed that the replacement work started November 1, 1988 and was completed November 4, 1988. *Id*. The NTSB Report (Table 2) identified 11 seams leaks or test failures in PG&E's natural gas transmission pipelines, including 3 on Line 132—the 1988 leak and two others found in 1948 and 1992. *Id*. at 39. Discussing several deficiencies it found in PG&E's integrity management practices, the NTSB noted that among them was the following: "[PG&E's integrity management program] did not consider known longitudinal seam cracks in Line 132 dating to the 1948 construction and at least one longitudinal seam leak in a DSAW weld in its identification and assessment procedures." *Id*. at 114.

Noting the NTSB's findings, the CPSD Report found of "particular importance" longitudinal seam weld defects discovered during radiography of girth welds during the 1948 construction of Line 132. Exhibit CPSD-1 at 33. The report faulted "PG&E's failure to analyze data on the 1948 Line 132 DSAW weld defects [which] resulted in an incomplete understanding of this manufacturing threat as it applied to Line 132." *Id.* CPSD found four additional manufacturing and construction defects on Line 132 that were not reflected in PG&E's 2004 BAP. *Id*. at 34-35. The 11 defects identified in the NTSB Report and the four additional defects identified by CPSD "that were not incorporated into PG&E's initial analysis of the condition of Line 132 for its 2004 Baseline Assessment Plan (BAP)" (CPSD Opening Brief at 43-44) are listed below:

- 1948, Line 132: Multiple longitudinal seam cracks found during radiography of girth welds during construction.
- 1958, Line 300B: Seam leak in DSAW pipe.
- 1964, Line 132: A leak was found on a "wedding band" weld; the leak was the result of construction defect. The defect was found on segment 200.
- 1974, Line 300B: Hydrostatic test failure of seam weld with lack of penetration (similar to accident pipe).
- 1988, Line 132: Longitudinal seam defect in DSAW pipe.
- 1992, Line 132: Longitudinal seam defect in DSAW weld when a tie-in girth weld was radiographed.
- 1996, Line 109: Cracking of the seam weld in DSAW pipe.
- 1996, Line 109: Seam weld with lack of penetration (similar to accident pipe) found during camera inspection.
- 1996, DFM-3: Defect in forge-welded seam weld.
- 1999, Line 402: Leak in ERW seam weld.

- 2002, Line 132: During a 2002 ECDA assessment, miter joints with construction defects were found on Segment 143.4.
- 2009, Line 132: A leak was found on Segment 189 that was caused by a field girth weld defect. Segment 189 was originally fabricated by Consolidated Western using DSAW and installed in 1948.
- 2009, Line 132: During the ECDA process, a defective SAW repair weld was found on Segment 186. As indicated in PG&E's pipeline survey sheet, the segment was originally fabricated by Consolidated Western using DSAW and installed in 1948.
- 2011, Line 300A: Longitudinal seam crack in 2-foot pup of DSAW pipe (found during camera inspection).
- 2011, Line 153: Longitudinal seam defect in DSAW pipe during radiographic inspection for validation of seam type.

CPSD asserts that PG&E failed to analyze the data on these defects, which it describes as weld defects, resulting in an incomplete understanding of the manufacturing threats to Line 132, in violation of 49 CFR 192.917(a) and ASME-B31.8S Section 2.2. CPSD alleges this as a continuing violation that ran from December 15, 2003 to September 9, 2010.

5.2.4.2.2. Leak Records and Manufacturing Threats

PG&E asserts that leak records are of marginal value to the identification of manufacturing defects. PG&E also asserts that ASME B31.8S-2004, Appendix A, Section 4.2, does not require operators to review leak records for purposes of determining the potential for a manufacturing threat. Referring to the testimony of witness Keas in the Recordkeeping OII (10 RK Tr. 1492-95), PG&E maintains that leak records are relevant to time-dependent threats such as internal and external corrosion but only tangentially-related to the

manufacturing threat identification process, as any leak that is significant enough to merit such analysis would result in a reportable pipeline incident.

While PG&E points to Appendix A of ASME B31.8S-2004, CPSD points to Table 1 of Section 4.3 of ASME B31.8S-2004. That table includes "leak/failure history" among required data elements in a prescriptive integrity management program. Also, while PG&E links the requirement to consider leak history to corrosion threats and not manufacturing threats, CPSD and the NTSB consider the requirement to be relevant more broadly because leaks can demonstrate problems with welds, not just corrosion. Exhibit CPSD-1 at 26; Exhibit CPSD-9 at 39. The NTSB also noted that PG&E's RMP-01 calls for it to "develop and maintain an inventory of all pipeline design attributes, operating conditions, environment (structure, faults, etc.), threats to structural integrity, leak experience, and inspection findings." Exhibit CPSD-9 at 59. This information is to be maintained in the GIS and used to calculate risk for each pipeline segment. *Id*. The NTSB further noted that PG&E's RMP-05, which contains the algorithm for design/material threats and also addresses construction threats, uses weighted factors that include leak history. CPSD-9 at 61-62.

To resolve CPSD's and PG&E's competing views of the applicable regulatory requirements, we note the following:

- 49 CFR 192.917 (a) provides that potential threats an operator must consider include, *but are not limited to*, the threats listed in ASME/ANSI B31.8S, Section 2.
- ASME-B31.8S Section 2.2 provides that *all* threats to pipeline integrity shall be considered.
- Non-mandatory Appendix A to ASME B31.8S, Paragraph A4.2 lists data sets that should be collected and reviewed before a risk assessment can be conducted with respect to manufacturing

> threat. While that list does not include leak history, Paragraph A4.2 states that the list is the *minimal* list of data sets required.

We do not find that the omission of "leak history" from Paragraph A4.2 is controlling. Taken together, the above requirements indicate that an operator should consider threats and data requirements that go beyond the minimum stated requirements. PG&E took an important step in that direction when it established risk management procedures that recognized the importance of leak histories, and PG&E clearly knew leak data is important and should be considered more broadly than just for corrosion threats. However, as CPSD has shown, and as more fully discussed below, PG&E did not always follow through and give adequate attention to the leak history of Line 132 or other lines.

5.2.4.2.3. 1988 Seam Defect

A March 1, 1989 internal memorandum from PG&E's Technical and Ecological Services to its Gas System Design, with the subject line "Bunker Hill 30 Transmission Line Failure" and with a materials failure report attached, addressed the 1988 leak on Line 132. It stated that (1) a section of Line 132 had several weld shrinkage cracks that were pre-service defects from the original manufacturing of the pipe joint, and (2) x-ray inspection showed the weld to be of low quality, containing shrinkage cracks and voids, lack of fusion, and inclusions. Exhibit PG&E-7, Exhibit 4-15. The memorandum stated that the leak was likely related to one of the weld defects. *Id.* The memorandum concluded that "[w]ith the leak removed, the remaining pipe should be fully operational again." *Id*.

PG&E contends that the 1988 Line 132 longitudinal seam defect did not indicate a manufacturing threat, noting that it was a very small pinhole leak. Exhibit PG&E-1C at 4-14. PG&E witness Keas testified that "leaks of this type do

not signal the presence of unstable manufacturing defects, as they have not been found to lead to pipeline ruptures." *Id*. at 4-15. PG&E witness Zurcher testified that DSAW pipe may exhibit manufacturing imperfections and experience small, pinhole-type leaks from time to time, and that such leaks do not signal the presence of unstable manufacturing defects. Exhibit PG&E-1 at 5-10 to 5-11. Keas concluded that even if PG&E had located records of the 1988 leak, there would have been no change in the company's manufacturing threat analysis, and no change in the assessment method used on Line 132. Exhibit PG&E-1C at 4-15.

We are pleased that PG&E saw fit to repair the Line 132 leak in 1988, even if PG&E is now convinced that pinhole leaks are insignificant because they do not lead to ruptures.[44] However, the fact that PG&E repaired that leak and put the pipeline back into service as "fully operational" does not address the requirement of 49 CFR 192.917(a) that "[a]n operator must identify and evaluate all potential threats to each covered pipeline segment." When PG&E implemented its integrity management program in 2004, it apparently did not consider it important to analyze whether the defect indicated the possibility of defects in other parts of Line 132. The question here is whether it was reasonable for PG&E's integrity management program to disregard the company's own findings of a manufacturing defect in the form of a low-quality weld with several defects as well as a pinhole leak likely related to those weld defects.

[44] CCSF points out that pinhole leaks may not be as insignificant as PG&E suggests. CCSF Opening Brief at 29. Pinhole leaks accounted for 6 of 17 reportable incidents involving longitudinal seam welds during the years 2002-2009. *Id.*, referring to Exhibit PG&E-1 at 5-10.

We conclude that it was not reasonable or consistent with integrity management requirements. While PG&E attempts to portray both the material failure and its omission from GIS as insignificant, the NTSB and CPSD experts suggest otherwise. The NTSB noted that PG&E's failure to consider the 1988 leak on Line 132 was "another defect not considered in the integrity management plan." Exhibit CPSD-9 at 111. CPSD's witness concluded that "the 1988 leak … at the very least identifies probable defects on Segment 181's long seam weld, and potentially unstable defects." Exhibit CPSD-5 at 24. CCSF also considers PG&E's failure to consider the 1988 defect a failure under integrity management regulations. Exhibit CCSF-1 at 5.

PG&E has not persuaded us it was reasonable, for integrity management purposes, for it to ignore evidence that it had pipe in service that the company's own records characterized as having a "material failure" and as having manufacturing longitudinal welding defects. PG&E's failure to include and analyze the 1988 leak data is an example of PG&E's failure to recognize and evaluate data that could indicate potential threats.[45]

5.2.4.2.4. 1948 Seam Defects

The NTSB report notes another design/material and construction defect on Line 132 that was documented in PG&E's records but not considered in its integrity management program. Exhibit CPSD-9 at 110-111. Radiography of

[45] We take no comfort in witness Keas' conclusion that PG&E's failure to consider the 1988 Line 132 leak was inconsequential because there would have been no change in the company's manufacturing threat analysis, and no change in the assessment method used on Line 132. This appears to be a retrospective analysis. PG&E does not show that, in 2004, its integrity management program included a documented, reasoned analysis that welding defects from manufacturing or pinhole leaks could be disregarded as being non-threats.

girth welds conducted in connection with the 1948 construction of Line 132 revealed at least four longitudinal seam weld cracks that were allowed to remain in service. *Id*. at 111. Because only 10% of the welds were radiographed, and the radiographs captured only a few inches of the longitudinal seam welds, less than 0.2% of the longitudinal seams on pipe segments installed in 1948 were radiographed. *Id*. The NTSB found that in light of the fact that five rejectable defects were found in the small percentage of longitudinal seam welds that were so examined, it is probable that additional longitudinal seam weld defects have remained in service since 1948. *Id*. As noted above, CPSD found these defects and PG&E's failure to analyze them for integrity management purposes to be of particular importance.

PG&E argues that the 1948 radiography records do not indicate a manufacturing threat that it should have identified. This is because PG&E's purchase specifications called for the pipe to be subjected to a 90% SMYS hydro test at the mill, and documentation for a 1949 purchase of the same type of pipe shows that a mill hydrostatic test was performed for that purchase. Exhibit PG&E-7, Exhibit 4-18 and Exhibit 4-20. This would have meant a mill test at 1170 psig, nearly three times the 400 psig MAOP of Line 132. Exhibit PG&E-7, Exhibit 4-19. PG&E notes that by design, any defects that do not fail during such a mill test are assumed to be safe and stable at the established operating pressure. Exhibit PG&E-1 at 6-5. PG&E thus argues that the 1948 construction radiography records did not indicate the presence of an unstable manufacturing threat.

We do not find that PG&E's reliance on its purchasing specifications to prove that mill tests were conducted at 1170 psi justifies disregarding, for integrity management purposes, data regarding the known longitudinal seam

defects on Line 132. As CPSD witness Stepanian noted, there is a question whether PG&E should have assumed a mill test was performed in the absence of documentation. Exhibit CPSD-5 at 28. Moreover, and more significantly, assuming there was a mill test on the Line 132 pipe, defects introduced after a mill test from other causes may interact with manufacturing defects. *Id*. Also, a mill hydrostatic test is not the same thing as a 49 CFR 192 Subpart J test. *Id*. It may be that "industry participants have operated on the principle that [mill tests] were of sufficient duration to (a) ensure that when a pipeline is placed in service any remaining manufacturing defects will be too small to fail at the maximum operating pressure; and (b) establish the expected level of pressure required to bring any remaining defects to failure." Exhibit PG&E-1 at 6-5. However, this does not adequately explain why, for integrity management threat identification purposes, it would be acceptable to disregard defects established by radiography. Indeed, as TURN points out, the argument that the industry could rely on mill tests is illogical given the evidence that ASME B 31.1.8, Section 841.411 established a requirement for a post-construction, pre-operation field strength test. TURN Opening Brief at 30. There would be no need for such requirements, later codified by both GO 112 and the CFR, if a mill test was adequate to assess integrity.

5.2.4.2.5. Other Seam Defects

In addition to the 1948 and 1988 seam defects discussed above, CPSD refers to 13 other defects on Line 132 and elsewhere on PG&E's system that, CPSD contends, PG&E should have considered in its BAP. (See list of 15 seam defects in Section 5.2.4.2.1 above.) PG&E does not dispute that these defects were not incorporated into its BAP, but it argues that they would not inform a manufacturing threat assessment of Line 132. PG&E contends that (1) most of

the listed records involve pipe dissimilar to the 30-inch DSAW pipe used in Line 132, (2) the reference to a long-seam defect on a segment of Line 132 in 1992 is based on a misinterpretation of statements made by a PG&E employee during an NTSB interview, and (3) the remaining items were discovered during testing carried out after the San Bruno accident.

PG&E has shown that defects in ERW, SAW, and forge-welded seams; girth welds; and miter joints would not be indicators of manufacturing threats in the longitudinal seams of DSAW pipe, and we therefore concur that those examples do not support CPSD's allegation regarding manufacturing threats on Line 132. We also concur that it is not appropriate to include the 2011 defects for purposes of this proceeding, which focuses on violations connected to the 2010 San Bruno disaster. Further, the reported 1992 defect on Line 132 is not adequately substantiated.

On the other hand, PG&E has not persuaded us that it was reasonable to disregard all the DSAW defects in pipe of different diameter or other attributes. PG&E witness Keas testified that "the bulk of the information identified by CPSD … relates to pipe of materially different specifications than the pipe used to construct Segment 180 (and the remaining portion of Line 132 built in 1948). Any long seam issues identified on these unrelated pipe segments are not applicable to the integrity analysis for pipe used to construct Line 132." Exhibit PG&E-1C at 4-18. However, she also answered "[y]es, in certain instances" when asked if "pipe of similar specification is relevant to pipeline integrity." 10 Jt. Tr. 1088: 10-18. In other words, materially different pipe may not be relevant to integrity analysis but similar pipe may be. CPSD has shown that PG&E should have considered defects flaws in pipe similar to the Line 132 DSAW pipe, and PG&E has not proven that 34" pipe is sufficiently dissimilar to 30" pipe to justify

ignoring its defects. Moreover, Keas asserted that the bulk of the information presented by CPSD involved materially different pipe specifications. She did not claim that all of the information involved dissimilar pipe.

As CPSD has asserted, PG&E has defined the threats too narrowly. We therefore decline to join PG&E in dismissing all of the examples cited by CPSD. PG&E has not adequately explained how a seam leak in DSAW pipe in Line 300B in 1958 is so irrelevant to the 1956-built Segment 180 using DSAW pipe that it should not have been considered in the baseline assessment. PG&E also has not shown that it was reasonable to disregard the 1974 Line 300B failure or the 1996 Line 109 DSAW seam weld crack. PG&E should have at least considered these defects in determining the presence of such threats.

5.2.4.2.6. Conclusion - Seam Weld Defects

PG&E's arguments that it was not required to consider and analyze known seam defect data in its integrity management program are not persuasive. PG&E did not always analyze the data on pipeline weld defects, which resulted in an incomplete understanding of the manufacturing threats to Line 132.[46] This is in violation of 49 CFR 192.917(a) and ASME-B31.8S Section 2.2. The seam defects at issue occurred in 1948, 1958, 1974, 1988, and 1996, long before the implementation of PG&E's integrity management program. This violation thus began at the outset of the compliance date for PG&E's integrity management program, December 17, 2004, and continued to September 9, 2010. This violation is significant because, as the NTSB noted:

[46] The findings of CCSF witness Gawronski that PG&E's integrity management process failed to consider weld defect reports from 1956, 1975, and 1996 on Lines 101 and 109 corroborate this finding. Exhibit CCSF-1 at 10-12.

> PG&E's failure to consider evidence of seam defects discovered during construction and operation of Line 132, as well as its weighting of factors so as to understate the threat of manufacturing defects, resulted in PG&E selecting an assessment technology (ECDA) that was incapable of detecting seam flaws like the one that led to this accident. Exhibit CPSD-9 at 112.

PG&E contends that this violation overlaps CPSD's allegations that PG&E (1) ignored DSAW as one of the weld types potentially subject to manufacturing defects in violation of 49 CFR 192.917(e)(3), and (2) violated 49 CFR 192.917(e) and (e)(3)(i), by not determining the risk of failure from defects of Line 132 after operating pressure increased above the maximum experienced during the preceding five years. PG&E Reply Brief, Appendix E at E-17. This contention is addressed in Section 5.2.4.4 below.

5.2.4.3. Cyclic Fatigue

49 CFR 192.917(e) provides that "[i]f an operator identifies any of the following threats, the operator must take the following actions to address the threat." One of the threats listed is cyclic fatigue.[47] 49 CFR 192.917(e)(2) states:

> *Cyclic fatigue*. An operator must evaluate whether cyclic fatigue or other loading condition (including ground movement, suspension bridge condition) could lead to a failure of a deformation, including

[47] PG&E witness Kiefner discussed the issue of cyclic fatigue in pipelines as follows:

> Transmission integrity management regulations require operators to evaluate threats to their pipeline network and address them according to their significance. One such threat that can affect pipelines as a general matter is cyclic fatigue. Pipelines may contain defects or imperfections arising from the manufacturing process. Cyclic fatigue is the process by which cycles of high and low pressure from the contents of a pipeline can enlarge such a defect over time. Left undetected and/or untreated, a defect enlarged by cyclic fatigue can lead to a service failure of a pipeline operating at maximum operating pressure. Exhibit PG&E-1 at 6-2 to 6-3.

> a dent or gouge, or other defect in the covered segment. An evaluation must assume the presence of threats in the covered segment that could be exacerbated by cyclic fatigue. An operator must use the results from the evaluation together with the criteria used to evaluate the significance of this threat to the covered segment to prioritize the integrity baseline assessment or reassessment.

CPSD asserts that PG&E did not incorporate cyclic fatigue or other loading conditions into its segment-specific threat assessments and risk ranking algorithm. Exhibit CPSD-1 at 51. CPSD notes that a PG&E "protocol matrix" applicable in 2005 indicated that cyclic fatigue was not considered a threat.[48] *Id*. CPSD notes that PG&E's protocol matrix applicable in 2010 confirms that PG&E excluded the threat of cyclic fatigue. *Id*. However, CPSD contends, 49 CFR 192.917(e)(2) unequivocally calls for cyclic fatigue to be evaluated as a threat, and PG&E should have undertaken the analysis required by that provision on Line 132 (and on all transmission lines), particularly for line segments that had not undergone hydrostatic pressure testing in accordance with 49 CFR 192, Subpart J. CPSD alleges this is a continuing violation of 49 CFR 192.917(e)(2), running from December 15, 2003 to September 9, 2010.

PG&E witness Keas responded that prior to the San Bruno disaster, the gas transmission industry understood the threat of failure of gas pipelines (as

[48] PG&E witness Keas explains that "[a]n audit protocol matrix is an internal PG&E document that we develop prior to regulatory audits as a review tool to identify the specific sections of our RMPs setting forth the procedures and policies that are the subject of the PHMSA audit protocol used by CPSD in its audits." Exhibit PG&E-1C at 4-30, Footnote 18.

opposed to liquid-transport pipelines) due to cyclic fatigue to be negligible.[49] Exhibit PG&E-1C at 4-28. Keas noted that this industry view was supported by a 2004 report by John Kiefner and Michael Rosenfeld,[50] and that a 2007 report by Kiefner[51] "underscored that, prior to the San Bruno incident, cyclic fatigue was not considered to be a common threat to gas transmission pipelines, particularly for pipe segments subjected to a hydro test reaching at least 1.25 times the pipeline maximum operating pressure." *Id*. at 4-29. Keas also notes that, by letter dated August 10, 2009 (Exhibit PG&E-3), PHMSA presented an analysis to the NTSB indicating that gas pipelines are not subject to significant risk of failure from pressure-cycle-induced growth of original manufacturing or construction defects and PHMSA records do not contain any known incidents involving failure of steel natural gas transmission pipe from pressure-cycle-induced growth of original manufacturing-related or transportation-related defects. *Id*.

PG&E has explained why it did not consider cyclic fatigue a threat based on expert studies and industry consensus, but it has not shown it was legal to do so. Essentially, PG&E determined that, system-wide, cyclic fatigue was never a threat to any segment. However, even if PG&E had reason to believe that the cyclic fatigue threat was negligible, that would not give it reason to disregard

---

[49] PG&E witness Kiefner confirms this view, explaining that cyclic fatigue is a significant threat to liquid petroleum pipelines, not natural gas pipelines. Exhibit PG&E-1 at 6-3.

[50] John Kiefner and Michael Rosenfeld, *Effects of Pressure Cycles on Gas Pipelines Final Report*, September 14, 2004.

[51] John Kiefner, *Evaluating the Stability of Manufacturing and Construction Defects in Natural Gas Pipelines*, Final Report No. 05-12 R, April 26, 2007.

federal regulations that unequivocally require operators to consider cyclic fatigue. As CPSD witness Stepanian testified:

> However, to identify if a threat exists an operator must first do the analysis. Part 192.917(e)(2) requires operators must consider the threat from cyclic fatigue. PG&E could not produce any documentation to prove that the analysis was done. The analysis should have included not only an estimate of expected fatigue life, but an estimate of the probability of other defects interacting with cyclic fatigue such as manufacturing defects, construction defects arising from installation of the pipeline, and third-party damage. PG&E did not do this analysis, but made a blanket determination based on the 2007 DOT report authored by Dr. Kiefner. In doing the analysis required by Part 192.917(e)(2), the operator must consider the probability of other defects interacting with potential manufacturing defects and how cyclic fatigue could increase the risk of failure. Exhibit CPSD-5 at 31.

Moreover, Stepanian notes, the 2007 Kiefner report states that the risk of failure from cyclic fatigue rises exponentially as the pressure test level decreases toward 1.00, which assumes a pressure test was done. *Id.* at 32. In the absence of documented pressure test records, PG&E should have assumed that there was no pressure test and analyzed the segment for the threat of cyclic fatigue. *Id*. 49 CFR 192.917(e)(2) does not say a low probability threat can be ignored. *Id*. We find this testimony persuasive. The 2007 Kiefner study does not establish that cyclic fatigue is never a factor on any segment. It shows that an operator must know the pipeline characteristics and use that data in the calculation of the expected life of the pipeline, on a case-by-case basis.

PG&E maintains that it was not required to conduct segment-specific threat analyses but could instead rely on "referencing the prior industry research rather than conducting a detailed assessment of their own pipelines." PG&E Opening Brief at 77. As noted earlier, however, PG&E witness Keas testified that

cyclic fatigue was not considered to be a threat to gas transmission pipelines, particularly for pipe segments subjected to a hydro test reaching at least 1.25 times the pipeline maximum operating pressure. PG&E in effect acknowledges that hydro testing is significant, but does not explain how a blanket determination that cyclic fatigue is not a threat would account for the need to consider whether any individual segments had undergone a hydro test.

CPSD has proven that PG&E violated 49 CFR 192.917(e)(2) by failing to consider and test for the threat of cyclic fatigue on Segment 180. This violation began on December 17, 2004, when PG&E became subject to integrity management requirements, and continued to September 9, 2010.

5.2.4.4. DSAW Pipe

CPSD alleges four separate integrity management violations in connection with its discussion of threat identification violations associated with PG&E's treatment of DSAW pipe. CPSD Opening Brief at 45-46; Revised Appendix C at 3-4. Three of these alleged violations pertain to 49 CFR 192.917(e). The fourth pertains to 49 CFR 192.921(a) regarding baseline assessment methods. *Id.*

5.2.4.4.1. DSAW Pipe and Long Seam Manufacturing Defects

49 CFR 192.917(e)(3) provides that an operator must analyze a covered segment to determine the risk of failure from manufacturing and construction defects if the operator identifies such threats in the segment. CPSD contends that PG&E should have considered the category of DSAW as one of the weld types potentially subject to manufacturing defects, and that as a result of ignoring this threat, PG&E failed to determine the risk of failure from this defect, in violation of this requirement. We addressed aspects of this alleged violation earlier in

Section 4.4.3 of this decision (regarding PG&E's contention that several of CPSD's alleged violations inappropriately depend on hindsight knowledge).

In support of the allegation, CPSD notes that PG&E had records showing that the 1948 DSAW pipe from Consolidated Western had seam quality issues based on the rejection of some seam welds noted in the girth weld x-rays taken during installation and seam leaks and cracks found since the installation date. Exhibit CPSD-1 at 41. CPSD also notes that the *Integrity Characteristics of Vintage Pipelines* report (Vintage Pipelines Report), referenced by PG&E in its first revision of RMP-06, identifies DSAW as having manufacturing defects, including seam and pipe body defects. CPSD notes that Table E-6 of that report identified incidents associated with certain manufacturers during certain years related to pipe body and seam weld defects for DSAW pipe. *Id*.

PG&E witness Keas testified that 30-inch DSAW pipe manufactured by Consolidated Western did not have a history of failure, either in company or industry experience, and that such pipe was assigned a joint efficiency factor of 1.0 (equivalent to seamless pipe) pursuant to both federal regulation and its own integrity management practices. Exhibit PG&E-1C at 4-15. She went on to state that "prior to San Bruno, there was no reason for us, or any operator, to conclude that DSAW pipe contained a potential manufacturing seam threat under the integrity management rules. *Id*. at 4-16. Keas also disputes CPSD's interpretation of the Vintage Pipelines Report, asserting that, as reflected in the report, DSAW pipe welds are not particularly prone to anomalies such as long seam cracks. *Id*. at 4-21. Keas further states that "[w]hile there have been isolated occurrences of anomalies, these occurred only in pre-1960 pipe manufactured by Kaiser or U.S. Steel." *Id*. PG&E concludes that "all [operators]

considered DSAW pipe to be reliable and safe pipe not subject to a long seam threat." PG&E Opening Brief at 42-43.

Notwithstanding any general industry understanding that DSAW is one of the best performing seam weld types, there are several reasons PG&E could have and should have recognized that not all DSAW pipe was considered safe and reliable, and considered it a threat on Line 132:

- As noted above, PG&E's records showed that 1948 DSAW pipe from Consolidated Western had seam quality issues. PG&E has stated its belief that the pipe in question was most likely produced by Consolidated Western in 1948, 1949 or 1953. Exhibit CPSD-9 at 28. Thus, PG&E had in its possession information demonstrating that DSAW pipe from this company, in this time frame, was suspect.
- The Vintage Pipelines Report identifies DSAW as having manufacturing defects, including seam and pipe body defects. PG&E witness Keas downplays the significance of the report but acknowledges that certain pre-1960's pipe manufactured by Kaiser or U.S. Steel had "anomalies." CPSD points out that PG&E possessed a Moody Engineering report which noted that Kaiser provided an unspecified percentage of pipe plate to Consolidated Western for the manufacture of pipe, and that the Vintage Pipelines Report identified Kaiser as having a large number of incidents in the pipe body attributable to Kaiser pipe for the years 1949-1956.
- While it may be likely that the pipe in question was manufactured by Consolidated Western, it is not a certainty. The fact that PG&E did not know the manufacturer with certainty is reason for it to have taken a conservative approach and considered its DSAW pipe a threat.
- There were leak incidents on Line 132, as discussed earlier in Section 5.2.4.2.

Arguing that DSAW is not one of the seam types considered to be subject to seam integrity issues sufficient to merit inclusion in 49 CFR 192.917(e)(4),

PG&E notes that low-frequency Electric Resistance Welded (ERW) pipe is included in that section due to a large number of seam failures experienced in the industry in the late 1980's. PG&E Reply Brief at 65. However, the absence of DSAW from 49 CFR 192.917(e)(4) does not excuse PG&E's noncompliance with 49 CFR 192.917(e)(3). As CPSD witness Stepanian testified,

> PG&E cites Part 192.917 in stating that DSAW was not considered to be subject to a manufacturing threat under federal regulations. This is incorrect. There are two parts to this code section that discuss manufacturing threats: Part 192.917(e)(3) and Part 192.917(e)(4). Part 192.917(e)(3) is general in its discussion of the manufacturing threat, and does not cite specific manufacturing processes; also, Part 192.917(e)(3) specifically mentions seam defects. Part 192.917(e)(4) cites some specific manufacturing processes such as Electric Resistance Welded (ERW), lap welded pipe or other pipe satisfying the conditions in Appendices A4.3 and A4.4 (i.e., steel pipe greater than 50 years in age). If the specific pipe manufacturing processes referenced in Part 192.917(e)(4) and Appendix A4.3 were the only ones that needed consideration for a manufacturing threat, there would be no need for the more general Part 192.917(e)(3). Also, as discussed in Part 192.113, DSAW pipe has a longitudinal joint factor of 1.0 if it is manufactured according to certain specifications. Further, where the seam type is not known, then operators must default to the 0.6 or 0.8 longitudinal joint factor until sufficient knowledge is gained to determine the seam type. Exhibit CPSD-5 at 21-22.

DSAW may not be in the same category as ERW pipe, but CPSD has shown that PG&E should have deemed its DSAW pipe on Line 132 to be subject to a long seam manufacturing defect. As a result of ignoring the category of DSAW as one of the weld types potentially subject to manufacturing defects, PG&E failed to determine the risk of failure from this defect in violation of 49 CFR 192.917(e)(3). This violation continued from the initial December 17, 2004 integrity management compliance date to September 9, 2010.

As noted earlier, PG&E contends that this alleged violation overlaps the violation discussed in Section 5.2.4.2, where we determined that PG&E failed to analyze seam/weld defects on DSAW pipe in violation of 49 CFR 192.917(a) and ASME-B31.8S Section 2.2. However, these violations pertain to separate federal regulations regarding (1) the identification of all threats and (2) analysis to determine the risk of failure. While the underlying facts may overlap, the violations are separate and distinct.

5.2.4.4.2. Increased Operating Pressure in 2003 and 2008

In requiring operators to analyze covered segments to determine the risk of failure from identified manufacturing and construction defects, 49 CFR 192.917(e)(3) provides that an operator may consider such defects to be stable if the operating pressure on the covered segment has not increased over the maximum operating pressure experienced during the five years preceding identification of the HCA. However, it also provides that if any of three changed conditions apply, the operator must prioritize the covered segment as a high risk segment for the baseline assessment or reassessment. The first of the three conditions is "(i) Operating pressure increases above the maximum operating pressure experienced during the preceding five years."

CPSD states that "this means that the operator identifies the [Maximum Operating Pressure (MOP)] experienced during the 5 years prior to the identification of the HCA, and if a subsequent operating pressure exceeds that maximum baseline value (the MOP), a manufacturing and/or construction

defect must be considered potentially unstable."[52] Exhibit CPSD-1 at 42. CPSD notes that according to PHMSA FAQ-221,[53] any pressure increase, regardless of the amount, above the 5-year MOP would cause manufacturing and/or construction defects be considered unstable.

On December 11, 2003 PG&E operated Line 132 at 402.37 psig at 18:00 hours and at 402.60 psig at 19:00 hours. Exhibit CPSD-1 at 44. On December 8, 2008 PG&E operated Line 132 at 400.73 psig at 14:00 hours. *Id*. These pressures were measured at the Milpitas Terminal. *Id*. CPSD states this was done to establish a maximum baseline value. *Id*. Focusing on Segments 180 and 181 of Line 132, CPSD notes that a SCADA monitoring point at the end of the Half Moon Bay tap, which is upstream from the segments, is used as a proxy for pressures on those segments. *Id*. at 45. From 1998 until December 11, 2003 the highest pressure at the Half Moon Bay tap for which records are available was 372.19 psig. *Id*. The maximum pressure reached during the December 11, 2003 "clearance operation" was 382.64 psig.[54] *Id*. CPSD concluded that "the pressure

---

[52] The NTSB explained MAOP and MOP as follows: MAOP is defined by PHMSA as the maximum pressure at which a pipeline or segment may be operated under Title r9 of the CFR, whereas MOP is an operating limit defined by PG&E. Exhibit CPSD-9 at 1, Footnotes 6 and 7. As explained by PG&E, sometimes a line's MOP equals the MAOP, but when a line is cross-tied to a line with a lower MAOP, the higher rated line is limited by the MAOP of the lower rated line. *Id*. When it was open to Line 109, as it was at the time of the accident, the MOP of Line 132 was 375 psig. *Id*.

[53] Frequently Asked Questions (FAQs) promulgated by PHMSA are intended to "clarify, explain, and promote better understanding of the pipeline integrity management rules." Exhibit CPSD-1 at 42.

[54] While PG&E operated Line 132 at a little over 400 psig in 2003 and 2008 at the Milpitas Terminal, the NTSB Report explains that "the downstream pressures at the Martin Station in 2003 and 2008 were 383 psig and 382 psig, respectively, due to the normal pressure gradient." Exhibit CPSD-9 at 37.

at Half Moon Bay tap during the [2003] pressure spike exceeded the maximum operating pressure experienced in the previous 5 years by approximately 10 psi." *Id.* CPSD asserts that these pressure events triggered integrity management requirements that PG&E failed to follow.

As noted above, 49 CFR 192.917(e)(3) provides that an operator may consider manufacturing and construction defects to be stable if the operating pressure on the covered segment has not increased over the maximum operating pressure experienced during the five years preceding identification of the HCA. CPSD concluded that the HCA containing Segments 180 and 181 was identified before December 11, 2003. Exhibit CPSD-1 at 44. Because Segment 181 had been identified as having a manufacturing threat, CPSD concludes that PG&E should have identified it as having a potentially unstable manufacturing threat following the 2003 pressure increase. *Id*. at 46. CPSD also asserts that PG&E should have made the same determination on other HCA segments identified before December 11, 2003 where the manufacturing threat was identified and there was no hydrostatic test per 49 CFR Subpart J. *Id*. With respect to the 2008 pressure spike, CPSD notes that by then, both Segments 180 and 181 were identified as having a manufacturing threat. *Id.* at 48. Thus, according to CPSD, the 2008 pressure spike should have triggered consideration of an unstable manufacturing threat on both segments.

Based on the foregoing analysis, CPSD alleges that PG&E committed two violations of 49 CFR 192.917(e)(3) after operating pressure on Line 132 increased above the maximum operating pressure experienced during the preceding five years. First, CPSD alleges that PG&E failed to determine the risk of failure from manufacturing and construction defects. Second, CPSD alleges that PG&E failed to consider manufacturing and construction defects unstable and prioritize the

covered segments as high risk for the baseline assessment or a subsequent reassessment.

As a preliminary matter, we note that PG&E contends that these violations are duplicative. PG&E Reply Brief, Appendix D at D-7 to D-8. We concur. CPSD has not shown that PG&E separately (1) failed to determine the risk of failure and (2) failed to consider the defects as unstable. As presented by CPSD, and taking into account the construction of 49 CFR 192.917(e)(3), the alleged violations are more correctly framed as "failed to determine the risk of failure by failing to consider the defects as unstable." Accordingly, we consider and evaluate CPSD's two alleged violations as one. However, we do not find, as PG&E contends (PG&E Reply Brief, Appendix at E-17), that this alleged violation meaningfully overlaps the violation discussed in Section 5.2.4.2. There, we determined that PG&E failed to analyze seam/weld defects on DSAW pipe in violation of 49 CFR 192.917(a) and ASME-B31.8S Section 2.2. This alleged violation pertains the consequences of operating Line 132 at increased pressures on two occasions.

PG&E contends that the Segment 181 manufacturing threat was identified solely due to the fact that the segment was over 50 years old when identified in the 2004 BAP, suggesting that 49 CFR 192.917(e)(3) is inapplicable. Exhibit PG&E-1C at 4-16. PG&E also contents that a manufacturing threat is considered to exist only on segments built with pipe with a joint efficiency factor less than 1.0 or constructed from low-frequency ERW or flash-welded pipe. *Id.* However, as CPSD witness Stepanian testified, "pipe that meets the 50 year age criteria may have seam defects, along with other interacting defects that could be exacerbated by low temperatures or ground movement inducing additional forces at these defects." Exhibit CPSD-5 at 25. He also testified that the

"wording in Part 192.917(e)(3) makes no mention, or restriction that only certain types of manufactured pipe are included in the rule." *Id*. at 26. 49 CFR 192.917(e)(3) was not rendered inapplicable merely because PG&E identified Segment 181 as having a manufacturing threat solely because it was greater than 50 years old. Also, as TURN explains (TURN Opening Brief at 28), PG&E did not consider Segment 180 to be greater than 50 years old at the time of its 2004 BAP because Segment 180 was installed in 1956. However, the age of the pipe should be measured from its manufacturing date, not its installation date. *Id*., referring to 10 Jt. Tr. 966. Thus, PG&E should have identified a manufacturing threat on Segment 180. *Id*. CCSF similarly notes that Segment 180 should have been identified as having a manufacturing threat based on its age. CCSF Opening Brief at 32.

PG&E also disputes CPSD's contention that the HCA covering Segments 180 and 181 was identified prior to December 11, 2003. Exhibit PG&E-1C at 4-23 to 4-24. PG&E maintains that it did not identify HCAs until it implemented its integrity management plan in December 2004. *Id*. at 4-23 to 4-25. Thus, under PG&E's construct, the December 11, 2003 pressure increase would be part of the five-year baseline, not an increase above the baseline. PG&E also notes that the rule for identifying HCAs was not effective until 2004. *Id*. at 4-24.

However, CPSD has shown that PG&E actually identified HCAs prior to December 11, 2003. It is the date that the HCA identification takes place that is controlling, not the date that the federal integrity management rules became effective or the date that PG&E's integrity management plan was filed. Exhibit Joint-40 shows that Segment 180 had been assessed for an ECDA survey on December 9, 2003. This would only occur because PG&E had identified

Segment 180 as an HCA prior to December 9, 2003. Also, while the implementing regulations became effective a few weeks after the December 11, 2003 pressure increase, the 2002 Pipeline Safety and Improvement Act was signed into law on December 17, 2002. We therefore do not accept PG&E's argument that it had not identified HCAs prior to December 11, 2003 or could not have done so.

PG&E asserts that the 2008 pressure increase to 400.73 psig "would not have been considered to constitute a substantial change in operating conditions that would require the pipeline to be prioritized for assessment." Exhibit PG&E-1C at 4-25. PG&E witness Keas refers to the 2007 Kiefner DOT Report discussion holding that an increase of such small magnitude (less than one pound over pipeline MAOP on pipeline that has been pressure tested to at least 1.25 times MAOP) does not have the capability of rendering stable manufacturing threats on a seam unstable. *Id*. Keas recognizes that this conclusion conflicts with the guidance in PHMSA FAQ-221 that any pressure increase, regardless of the amount, above the 5-year MOP would cause manufacturing and/or construction defects be considered unstable. *Id.* at 4-26. Still, Keas dismisses FAQ-221 because "PHMSA FAQs are non-binding regulatory interpretations by staff that, like FAQ 221, often contain little, if any technical justification or support." *Id*.

We find that FAQ-221 is fully consistent with the plain meaning of 49 CFR 192.917(e)(3). Industry expertise and/or preference notwithstanding, the rule provides for no leeway. Any pressure increase, transient or otherwise, is covered. The December 2008 pressure increase should have prompted PG&E to consider any threats to have become unstable. PG&E failed to do so.

Therefore, PG&E violated 49 CFR 192.917(e)(3) by not considering manufacturing and construction defects on Line 132 unstable and prioritizing the covered segments as high risk for the baseline assessment or a subsequent reassessment, and thereby failing to determine the risk of failure from manufacturing and construction defects of Line 132 after operating pressure increased above the maximum operating pressure experienced during the preceding five years. While the first of the two pressure increases occurred in December 2003, the violation begin running on the integrity management compliance date, December 17, 2004, and continued to September 9, 2010

5.2.4.4.3. Baseline Assessment Method

Pursuant to 49 CFR 192.921(a), an operator must apply one or more designated baseline assessment method(s) best suited to address the threats identified on a covered segment. The method(s) to be selected depends on the threat to which the covered segment is susceptible. The designated methods include (1) internal inspection tools capable of detecting corrosion and any other threats to which the segment is susceptible; (2) pressure test conducted in accordance with Subpart J of Part 192; (3) direct assessment to address threats of external corrosion, internal corrosion, and stress corrosion cracking; and (4) other technology that an operator demonstrates can provide an equivalent understanding of the condition of the line pipe. [55]

[55] 49 CFR 192.921 addresses how baseline assessments are to be conducted. Accordingly, the alleged violation being addressed in this section is not technically a threat identification violation. As noted earlier, we are generally following the organizational structure of CPSD's opening brief, which addressed this alleged violation under heading "Threat Identification" and the subheading "DSAW Pipe."

CPSD states that assessment technologies capable of detecting unstable defects include In Line Inspection (ILI) and hydrostatic pressure testing (Exhibit CPSD-1 at 38, 47) but not ECDA. CPSD notes further that PG&E's engineers stated that they strongly preferred to use ILI on higher stress pipelines in order to obtain a better initial evaluation, but that using ILI was not financially viable given PG&E's funding of its Gas Transmission and Storage (GT&S). Exhibit CPSD-168 at 7-8. CPSD contends that by not performing pipeline inspections using a method capable of detecting seam issues, PG&E violated 49 CFR 192.921(a).

PG&E contends that CPSD's alleged violation is based on hindsight information not available to PG&E prior to the San Bruno disaster. Thus, according to PG&E, ECDA was an appropriate assessment method based on what it knew prior to the disaster. PG&E Opening Brief at 92. PG&E also notes that the federal regulations specifically identify ECDA as an acceptable assessment technique to address the threat of external corrosion, which is the primary threat to Line 132 that PG&E identified. PG&E Reply Brief at 80.

As discussed earlier, PG&E has inappropriately relied on its hindsight argument in this proceeding. Not only did PG&E's engineers prefer ILI and hydrostatic testing over ECDA, PG&E should have known there were threats beyond external corrosion when it selected an assessment method. PG&E's lack of knowledge is attributable to several oversights on its part. It did not maintain the records showing the existence of the Segment 180 pups, which had severely compromised seams. Exhibit CPSD-1 at 66. It ignored the 30 inch seamless designation, even though no such pipe ever existed. *Id*. It ignored the "Integrity Characteristics of Vintage Pipelines" report that identifies some DSAW from some manufacturers as having manufacturing defects, including seam and pipe

body defects on the type and year of pipeline purchased for Segment 180. *Id*. at 41-42. It failed to perform hydrotesting on Segment 180, even though the industry guidelines called for it. *Id.* at 65. It did not record the leak history for Line 132 in its GIS, which could have alerted PG&E to potential seam defects, even though ASME B31.8S-2004, Section 4, "Data Elements for Prescriptive Pipeline Integrity Program", call for "leak/failure history" to be gathered and analyzed. *Id*. at 26. It failed to consider cyclic fatigue in its risk algorithms, failed to evaluate cyclic fatigue on a segment-by-segment basis, and disregarded cyclic fatigue for any of it pipelines. *Id.* at 38. Its risk-ranking weighted "design/materials" only 10%, when its real-world experience from 2004-2010 showed that 24% of incidents were due to "design/materials" defects. *Id*. at 55-56. These threats involve potential seam issues and were not knowable only in hindsight.

In short, information leading to the conclusion that ECDA was not the appropriate assessment method on Line 132 would have been available to PG&E had it fully complied with integrity management regulations. Had PG&E noticed any of the potential seam defects, it should have chosen an assessment tool capable of detecting them, not ECDA. By not performing pipeline inspections using a method capable of detecting seam issues, PG&E violated 49 CFR 192.921(a). This violation ran from December 17, 2004 and continued to September 9, 2010.

5.2.4.5. ERW Pipe

As noted in Section 5.2.4.4.1, 49 CFR 192.917(e)(4) specifically recognizes the threat posed by ERW pipe. If a pipeline contains low frequency ERW pipe and is subjected to a pressure increase above the 5-year MOP, 49 CFR 192.917(e)(4) requires an operator to "select an assessment technology or

technologies with a proven application capable of assessing seam integrity and seam corrosion anomalies."

Referring to the NTSB Report, CPSD notes that Line 132 includes several ERW segments. Exhibit CPSD-9 at 36. CPSD states that following the pressure events described earlier in Section 5.2.4.4.2, PG&E did not consider any possible threats to have become unstable as a result, and therefore selected ECDA as its assessment tool for Line 132. *Id.* at 111. CPSD asserts that ECDA is not the appropriate tool and that, instead, pressure testing and in-line inspection are appropriate methods to assess the integrity of the entire pipe section to which they are applied. *Id*. ECDA assesses only the integrity of selected pipe areas where the operator suspects a problem, and provides information only about threats that the operator is specifically looking for, whereas ILI and hydrostatic testing can identify critical threats that the operator might not have been looking for. *Id*. CPSD contends that because PG&E failed to use an appropriate tool capable assessing the threats identified with respect to ERW pipe, PG&E violated 49 CFR 192.917(e)(4).

PG&E asserts that it did not receive adequate notice of this alleged violation. PG&E Reply Brief at 69. PG&E notes that the term ERW appears only three times in the CPSD Report, none of them in connection with any alleged violation. *Id*. PG&E also contends that CPSD's allegation lacks evidentiary support.

We find that CPSD failed to provide adequate notice of this alleged violation and therefore do not sustain it. Additionally, CPSD relies on a footnote in the NTSB Report (Exhibit CPSD-9 at 36, Footnote 56) that simply states "Line 132 includes several ERW segments." However, CPSD does not identify those segments with any specificity or show that those segments are located in

an identified HCA. CPSD also does not show which, if any, segments are low-frequency ERW pipe manufactured prior to 1970 (a criterion that both CPSD and PG&E agree is one element of the alleged violation).

5.2.5. Alleged Risk Assessment Violations

5.2.5.1. Introduction

CPSD explains that risk assessment is the process by which each individual pipeline segment in PG&E's system is given a risk score that is used to rank the segments for assessment (physical examination). Exhibit CPSD-1 at 54. CPSD goes on to note that the risk score is determined as the product of the Likelihood of Failure (LOF) and the Consequence of Failure (COF) factors. *Id*. If either factor is inaccurate, the risk score and risk ranking will be inaccurate. *Id*.

Sections 5.2.5.2 through Section 5.2.5.5 below address four alleged violations related to the risk assessment requirements of the integrity management regulations set forth in 49 CFR 192.917 (c), which states:

> *Risk assessment*. An operator must conduct a risk assessment that follows ASME/ANSI B31.8S, section 5, and considers the identified threats for each covered segment. An operator must use the risk assessment to prioritize the covered segments for the baseline and continual reassessments (§§192.919, 192.921, 192.937), and to determine what additional preventive and mitigative measures are needed (§ 192.935) for the covered segment.

5.2.5.2. Use of Unsubstantiated Data

ASME-B31.8S Section 4.4, incorporated by reference into 49 CFR 192, states among other things that "[r]ecords shall be maintained throughout the [data collection, review, and analysis] process that identify where and how unsubstantiated data is used in the risk assessment process, so its potential impact on the variability and accuracy of assessment results can be considered." CPSD alleges that PG&E repeatedly used assumed values where it did not have

verified and accurate data, and that it was impossible for PG&E to know the variability or accuracy of assessment results as a consequence of failing to identify where and how such unsubstantiated data was being used, in violation of ASME-B31.8S Section 4.4.

The essence of this alleged violation is the assertion that PG&E failed to identify where and how it used unsubstantiated data. However, there is no discussion of or reference to this alleged violation in CPSD's testimony. Revised Appendix C to CPSD's opening brief makes reference to CPSD testimony regarding data gathering and integration requirements, PG&E's RMP-06, PG&E's failure to use conservative assumptions, PG&E's risk ranking algorithm, and the NTSB Report's discussion of problems with PG&E's GIS and PLSSs. However, it does not demonstrate that PG&E received adequate notice of the asserted facts underlying the alleged violation prior to the evidentiary hearings. Accordingly, we do not sustain it.

5.2.5.3. Risk Assessment Considerations

CPSD notes that 49 CFR 192.917(c) and ASME-B31.8S Section 5.7 prescribe the characteristics of an effective risk assessment approach. CPSD further notes that Section 5.7 provides that these characteristics shall include, among several other things, a defined logic and a structure to provide a complete, accurate, and objective analysis of risk (Section 5.7 (a)); operator consideration of the frequency and consequences of past events, including the subject pipeline system or a similar system (Section 5.7 (c)); and, for missing or questionable data, operator determination and documentation of the default values that will be used and why they were chosen (Section 5.7 (e)).

Referring, although without specificity, to facts underlying other alleged violations, CPSD in its opening brief (at 47) alleges that PG&E violated 49 CFR

192.917(c) and ASME-B31.8S Section 5.7 by PG&E (1) failing to conduct risk assessment that considers the identified threats, (2) failing to consider the consequences of past events on Line 132, and (3) failing to account for missing or questionable data.

CPSD has not supported all elements of this broadly worded and multi-faceted alleged violation. For example, CPSD points us to the provision of ASME-B31.8S Section 5.7 (a) that requires an operator's risk assessment approach to include a defined logic and a structure to provide a complete, accurate, and objective analysis of risk, but it does not indicate the particular facts it relies on to demonstrate that PG&E's approach to risk assessment lacked both a defined logic and an appropriate structure. Also, while we have found that PG&E did not always identify all threats that it should have (see Section 5.2.4 above), that alone does not necessarily prove that PG&E's risk assessment approach failed to consider the threats that it did in fact identify. Accordingly, we do not determine that CPSD has proven this alleged violation.

5.2.5.4. Risk Ranking Algorithms

Drawing from both the NTSB Report and a 2011 CPSD/PHMSA risk assessment audit of PG&E, CPSD contends there were several deficiencies in PG&E's risk ranking algorithm. Exhibit CPSD-1 at 55-59. First, CPSD contends that PG&E did not properly weigh the threats to Line 132 because PG&E did not include its actual operating experience, instead substituting industry experience. *Id*. at 56. PG&E's algorithm weighted external corrosion 25%, third-party threat 45%, ground movement 20%, and design/materials 10%, but PG&E's incident statistics for the years 2004-2010 show that external corrosion was 51% of combined leaks, design/materials accounted for 24% of combined events,

third-party accounted for 24% of incidents and ground movement accounted for 0% of incidents. *Id*. CPSD also contends that PG&E failed to:

- Properly identify the Potential Impact Radius (PIR) of a rupture, by using a value of 300 feet where the PIR is less than that. Exhibit CPSD-1 at 57-58.
- Identify the proper Consequence of Failure formula, by not accounting for higher population densities. *Id.* at 58.
- Use conservative values for electrical interference on Line 132, which created an external corrosion threat. *Id*.
- Include any consideration of "one-call tickets," which indicates third party damage threats. *Id*.
- Include any consideration of historic problems with the type of pipe used on Segment 180. *Id*. at 59.

CPSD concludes that PG&E violated 49 CFR 192.917(c) and ASME-B31.8S Section 5 by using dangerously inaccurate risk algorithms, resulting in risk assessments that underplayed the danger of leaks and overstated the threat from third-parties, among other things.

Referring to the testimony of witness Zurcher (Exhibit CPSD-1 at 5-16), PG&E asserts that the risk algorithm deficiencies asserted by CPSD are more properly viewed as competing perspectives on best practices rather than failures to conform to regulatory requirements. PG&E Reply Brief at 81. PG&E also notes that ASME-B31.8S Section 5.7(i) provides that risk assessment weighting factors "can be based on operational experience, the opinions of subject matter experts, or industry experience," and that ASME-B31.8S Section 5.4 provides that risk assessment models "should be used in conjunction with knowledgeable, experienced personnel (subject matter experts and people familiar with the facilities)" in order to make appropriate risk determinations. *Id*. PG&E goes on to assert that "[t]he purported deficiencies in PG&E's risk assessment model are

thus more appropriately viewed in recognition of the fact that pipeline integrity management programs (and risk assessment models) are in a constant state of evolution based on information learned over time." *Id*. at 81-82, referring to witness Keas at Exhibit PG&E-1C at 4-32.

The provisions of ASME-B31.8S cited by PG&E may allow it to rely on its operational experience, subject matter experts, or industry experience to develop and apply a risk assessment and ranking model, and they may allow some room for professional differences of opinion, but PG&E has not shown that they provide a license for it to use improper PIR values, fail to account for higher population densities in the COF formula, use non-conservative values for electrical interference, fail to consider one-call tickets as indicating third party damage threats, or fail to consider historic problems with the type of pipe used on Segment 180.

As to weighting factors of PG&E's model, we are neither persuaded nor assured by Mr. Zurcher's claim that it was appropriate for PG&E to "leverage the aggregate threat assessment experience of pipeline operators over time and across the industry" rather than rely on its own actual experience. Exhibit PG&E-1 at 5-16. It is clear to us that the federal integrity management regulations are intended to require an operator to go beyond industry norms and give due consideration to the state of its own system.[56] The preponderance of the evidence persuades us that PG&E's weighting factors resulted in an inappropriate risk ranking that failed to reflect PG&E's own system conditions.

[56] CCSF notes that in 2009, a PG&E consultant found PG&E's weighting was a weakness. CCSF Opening Brief at 26, referring to Exhibit Joint 48 at 3.

The risk algorithm deficiencies cited by CPSD represent more than mere differences of opinion. PG&E violated 49 CFR 192.917(c) and ASME-B31.8S Section 5, by using risk ranking algorithms that did not: (1) properly weigh the threats to Line 132, because PG&E did not include its actual operating experience; (2) properly identify the Potential Impact Radius of a rupture, by using a value of 300 feet where the PIR is less than that; (3) identify the proper Consequence of Failure formula, by not accounting for higher population densities; (4) use conservative values for electrical interference on Line 132, which created an external corrosion threat; (5) include any consideration of one-call tickets, which indicates third party damage threats; and (6) include any consideration of historic problems with the type of pipe used on Segment 180. This violation ran from December 17, 2004 and continued to September 9, 2010.

5.2.5.5. Planned Pressure Spikes

PG&E engaged in a practice of "spiking" the pressure of certain transmission lines to maintain operational flexibility, which included increasing the pressure on Line 132 to a little over the system MAOP of that line so it could increase pressure as needed for customer demand.[57] Exhibit CPSD-1 at 40. CPSD asserts that at the same time, PG&E believed it would eliminate the need to consider manufacturing and construction threats as unstable as a result of increasing the pressure above the 5-year MOP. *Id*. CPSD notes that identifying those threats as unstable would mean that an assessment method capable of assessing seam, girth weld, and other manufacturing and construction anomalies would need to be used (hydrostatic testing or in-line inspection). *Id*.

[57] Section 5.2.4.4.2 above discusses the 2003 and 2008 pressure increases on Line 132 in greater detail.

CPSD notes that this practice has not been approved by either PHMSA or the Commission. CPSD Opening Brief at 50. Essentially, CPSD alleges, PG&E engaged in the practice of increasing the pressure on Line 132 every five years to set the MAOP for the purpose of avoiding the need to deem manufacturing and construction threats unstable, thereby avoiding hydrostatic testing or in-line inspections on Line 132. *Id*. CPSD argues that because of the pressure excursions a test capable of detecting seam problems was required, and that Segment 180 would not have survived a proper hydrostatic test because it would have been subjected to pressures greater than the pups were capable of withstanding. *Id*. CPSD alleges that this practice created an unreasonably unsafe system in violation of Public Utilities Code Section 451.

CPSD's allegations are also supported by the NTSB Report, which includes the following discussion of PG&E's practice of raising the pressure on Line 132:

> PG&E raised the pressure at the Milpitas Terminal to 400 psig in 2003 and 2008 to set a 5-year MOP for Line 132. The PG&E director of integrity management and technical support acknowledged at the NTSB investigative hearing that this practice allowed PG&E to regard manufacturing threats as stable, thereby continuing to use only ECDA as the assessment method. Thus, this practice allowed PG&E to avoid seam integrity inspections it might otherwise have been required to conduct. However, the PHMSA deputy associate administrator for field operations testified at the investigative hearing that it was not the intent for this rule to be used to avoid an assessment. (PG&E has discontinued this practice since the accident.) Exhibit CPSD-9 at 112.

PG&E contends that the federal regulations recognize that pressure excursions occasionally occur and operators are only required to report such excursions if the pressure reaches 110% of the pipeline MAOP. PG&E Reply Brief at 82-83. Because the Commission's GO 112-E incorporates these federal regulations, PG&E argues that CPSD's assertion of a violation for any pressure

excursion above MAOP conflicts with the Commission's own adopted regulations. *Id*. We find, however, the pressure increases at issue are not just "any pressure excursion." The concern raised by CPSD, and one which we share, is that PG&E made a decision to raise the pressure in order to gain greater operational flexibility and, at the same time, it avoided the need to deem manufacturing and construction threats unstable. It is not the pressure increases themselves that warrant our greatest concern.[58] It is, instead, the avoidance of the need to pursue integrity management procedures that would otherwise be required of an operator, *i.e.*, to deem manufacturing and construction threats unstable and conduct appropriate testing. Since those procedures are designed to improve safety, avoidance of them is an unsafe practice.

PG&E refers to the testimony of integrity management witness Zurcher, who stated:

> Well, to be honest with you there was a time that we actually advised companies that they should run up to their MAOP at every opportunity. So there are a lot of companies that I know that have personally written into their integrity management programs a requirement to run up to MAOP at least once every five years. Again, some companies felt it was a requirement of the regulations. 8 Jt. Tr. 785-786.

Witness Zurcher testified that this advice was given from approximately 2002 to approximately 2010. *Id*. As we have repeatedly stated, departure from regulatory requirements is not justified by industry practice, even where industry practice is informed by knowledgeable experts.

---

[58] This is not to say that the planned pressure increases are not a concern. As CCSF witness Gawronski stated, increasing the pressures as PG&E did can affect the stability of manufacturing and construction defects. Exhibit CCSF-1 at 16.

Finally, PG&E argues that this is a "repackaged allegation" that is duplicative of CPSD's allegations related to threat identification and integrity assessments. However, the unsafe condition at issue here pertains to the practice of avoiding the need to determine that threats are unstable. While the facts are related, the violations alleged by CPSD are separate and distinct.

PG&E violated Public Utilities Code section 451 by engaging in the practice of increasing the pressure on Line 132 every five years to set the MAOP for the purpose of eliminating the need to deem manufacturing and construction threats unstable, thereby avoiding the need to conduct hydrostatic testing or in-line inspections on Line 132. We find this to be a continuing violation that ran from the December 17, 2004 integrity management compliance date to September 9, 2010. Even though the actual pressure increases occurred on two occasions in 2003 and 2008, the unsafe practice at issue goes beyond the actual pressure excursions. It reflects avoidance of the need to deem manufacturing and construction threats unstable and, therefore, avoidance of the need to conduct hydrostatic testing or in-line inspections on Line 132. PG&E's failure to carry out these integrity management requirements unnecessarily created an unsafe condition—untested pipeline segments—that continued daily from the implementation of the integrity management rule to September 9, 2010.

5.3. SCADA System and the Milpitas Terminal

5.3.1. Overview

An overview of the SCADA system and the Milpitas Terminal is provided in Sections 2.3.2 and 2.3.3.

49 CFR 192.605(a) requires operators to prepare and follow a manual of written procedures for conducting operations and maintenance activities as well as emergency response. 49 CFR 192.605(b) states that the manual must include

procedures for "operating, maintaining, and repairing the pipeline in accordance with each of the requirements of this subpart and subpart M of this part." 49 CFR 192.605(c) states that for transmission lines, the manual shall include procedures for responding to, investigating, and correcting the cause of several enumerated conditions when operating design limits have been exceeded (abnormal operations). 49 CFR 192.13(c) requires gas operators to maintain, modify as appropriate, and follow the plans, procedures, and programs that it is required to establish under Part 192. In other words, operators must both create the procedures and follow them.

In 2009, PG&E issued "Work Procedures (WP) 4100-10 Gas Clearance Procedures for Facilities Operating Over 60 PSIG," prescribing gas system operation procedures for Brentwood Gas Control, System Gas Control, and all manned stations. Exhibit CPSD-1 at 82. It requires "system clearance" for work that affects gas flow, gas quality, or the ability to monitor the flow of gas, and all such clearances require authorization from PG&E's Gas System Operations. *Id*. WP 4100-10 requires the clearance supervisor to report key communication steps identified in the sequence of operations to Gas Control including operation of any piece of equipment that affects the flow and/or pressure of gas or ability of Gas Control personnel to monitor the flow and/or pressure of gas on SCADA. *Id*. at 83-84.

Alleged violations associated with the SCADA system and the Milpitas terminal are significant since the unplanned pressure increase on the afternoon of September 9, 2010 contributed to the Line 132 rupture that caused the San Bruno explosion and fire. PG&E notes that the pressure never exceeded the MAOP for Line 132. Nevertheless, the situation was not as well in hand as PG&E implies. At 5:21 p.m. automatic pressure control was lost, which was attributable

to an intermittent short, starting a cascade of failures in the gas pressure sensors and pressure controls. Exhibit CPSD-1 at 95. It is deeply troubling that at 6:02 p.m., shortly before the rupture, an operator commented to a SCADA operator at the Brentwood facility that "we've got a major problem at Milpitas and we've over pressured the whole peninsula." Exhibit CPSD-9 at 12.

5.3.2. Clearance to Replace Temporary UPS

The Milpitas Terminal UPS had been in service since the late 1980s with a three-phase system that was no longer needed and for which parts were no longer available. Exhibit CPSD-1 at 81. PG&E decided to replace the UPS system, and in February 2010 it asked a contract engineer to offer a proposal to investigate and provide recommendations for the UPS/battery problems. *Id.* In mid-March 2010 a contract work authorization was approved for the contract engineer to perform the proposed work on the UPS at Milpitas Terminal. *Id.* However, on March 31, 2010, the UPS at Milpitas Terminal failed, exposing the gas control system to a short interruption of power and potential loss of pressure control.[59] *Id.* PG&E installed temporary mini-UPS units on April 1- 2, 2010 to provide temporary backup power to the station electronic valve controllers. *Id.*

[59] PG&E contends that the UPS did not fail in its operations. Instead, PG&E contends that the UPS did not function during testing as required for reliable operations. PG&E Reply Brief at C-6. Notwithstanding PG&E's explanations, that strikes us as a failure. PG&E also notes that pneumatically operated monitor valves which are not dependent on electrical supply provided redundancy to the pressure limiting system. However, as CPSD explains, monitor valves are outside the process control system. Exhibit CPSD-5 at 35. They provide protection against catastrophic failure but are not part of the automatic pressure control system. *Id.* Relying on the single layer of over-pressure protection does not provide adequate integrity. *Id.* at 36. Valves employed for pressure limiting fail on average every 1.67 years. *Id.*

A clearance application to replace the temporary UPS units installed in April 2010 with a permanent UPS was submitted on August 19, 2010 as Clearance Number MIL-10- 09. Exhibit CPSD-1 at 83. It was approved by PG&E Gas Control on August 27, 2010. *Id*. The UPS work required a system clearance since the work would affect the ability to monitor the flow of gas. *Id*. at 82. There was no clearance for the work performed in April 2010 due to the unplanned outage caused by the unexpected failure of the UPS. *Id.*

CPSD asserts that there were a number of instances where WP 4100-10 was not adhered to in Clearance MIL-10-09. Exhibit CPSD-1 at 84. CPSD also asserts that the clearance application went through a process of review and approval without the details required by PG&E's procedure, and that the clearance form did not adequately detail the work to be performed. *Id.*; Exhibit CPSD-9 at 90. CPSD notes the following issues with the clearance process followed by PG&E:

- PG&E's WP 4100-10 requires a designated Clearance Supervisor for all clearances at all times. MIL-10-09 marked the Clearance Supervisor as "TBD." Exhibit CPSD- 1 at 83.
- A checkbox on MIL-10-09 asks if normal function of the facility will be maintained was checked "No." The clearance application requires an explanation whenever this box is checked "No." However, there was no explanation provided on the clearance application as to how the work would affect normal function of Milpitas Terminal. *Id*. CPSD notes that the importance of this explanation was illustrated when, after the rupture (at 7:05 p.m.), a SCADA operator (incorrectly) stated, "it was a regular scheduled clearance, it wasn't supposed to affect anything." Exhibit CPSD-9 at 90.
- Under the Sequence of Operations, the clearance application showed "Report On Daily and Report Off." It did not list any specific operations or key communication steps to be reported to Gas Control. Exhibit CPSD-1 at 83.

- One of the steps taken during the UPS work at Milpitas Terminal was switching the controllers to manual which locks the valve to its current setting and disables Gas Control's ability to change the valve settings remotely. This should have been clearly stated on the clearance application as a key communication step within its sequence of operations. *Id*. at 83-84.
- WP 4100-10 requires the Clearance Supervisor to fill in any steps in a system clearance with the time, date, and initials of the person completing the step and file the clearance as completed. CPSD notes that there is no record provided by PG&E showing the specific steps taken and the time, date, and initials of the person completing each step in the system clearance. *Id*. at 84.

Referring to the NTSB Report, CPSD notes that due to the lack of detail on the work clearance form for UPS replacement, the SCADA operators would not have been aware of the scope and magnitude of the work being performed at the Milpitas Terminal. Exhibit CPSD-9 at 90. CPSD alleges that by failing to follow its internal work procedures, PG&E violated 49 CFR Part 192.13(c). CPSD alleges this as a one-time violation that occurred on September 9, 2010.

PG&E acknowledges and does not dispute this violation. PG&E Opening Brief at 103. PG&E contends, however, the field crew and gas system operators followed good communication practices and took actions focused on safety. *Id*. PG&E also notes that the unplanned pressure increase that occurred on September 9, 2010 resulted from an unexpected failure of two power supplies not involved in the clearance work that day. 2 Jt. Tr. 92.

The evidence shows that PG&E violated 49 CFR 192.13(c) by failing to follow its internal work procedures that are required to be established under Part 192. This violation occurred on September 9, 2010.

5.3.3. Clearance Procedure Failure as Unsafe Condition

CPSD alleges that PG&E's failure to follow its internal work procedures, as discussed in the previous section, resulted in an unreasonably dangerous condition on September 9, 2010, in violation of Public Utilities Code Section 451.

While PG&E acknowledges that its failure to follow its work procedures violated federal regulations, it asserts that it did not receive notice that CPSD would allege a Section 451 violation for unsafe conditions. However, as discussed in Section 4.2, under Section 451 California utilities including PG&E have always been on notice that they must at all times maintain safe facilities and operations.

PG&E does not argue or provide evidence that its failure to follow its clearance procedure was a safe practice, nor could it have. As CPSD witness Stepanian notes, the clearance application did not contain any details as to the extent of the work being performed and how it could impact the ability of gas control operators to monitor and control the Milpitas Terminal through the SCADA system. Exhibit CPSD-1 at 85. PG&E's failure to follow work clearance procedures was not just a technical violation of federal regulations; it was unsafe.

By failing to follow its work procedures on September 9, 2010, PG&E created an unreasonably dangerous condition in violation of Section 451. This violation occurred on September 9, 2010.

5.3.4. Procedures for Abnormal Conditions

As noted above, 49 CFR 192.605(c) states that the procedural manual required by 49 CFR 192.605(a) must include procedures for responding to, investigating, and correcting the cause of, enumerated conditions to provide safety when operating design limits have been exceeded. Those conditions are:

- Unintended closure of valves or shutdowns;
- Increase or decrease in pressure or flow rate outside normal operating limits;
- Loss of communications;
- Operation of any safety device; and
- Any other foreseeable malfunction of a component, deviation from normal operation, or personnel error, which may result in a hazard to persons or property.

Despite these requirements, CPSD found that PG&E's WP 4100-10 did not require pre-planning for handling any abnormal operations that may be encountered during the clearance work. Exhibit CPSD-1 at 85. CPSD asserts that as a result, PG&E's workers did not anticipate the extent of any abnormal conditions that may be encountered during the UPS clearance work, and they did not prepare for how to address these abnormal conditions prior to performing the UPS work in Milpitas. *Id*. CPSD asserts that even though PG&E was required by 49 CFR 192.605(c) to specifically prepare for an "increase or decrease in pressure…outside normal operating limits" as well as "loss of communications," on September 9, 2010, PG&E was not prepared for these abnormal conditions.

CPSD asserts that if the clearance form had included the necessary information, the SCADA operators would have at least been aware that power interruptions were planned to specific instrumentation at the Milpitas Terminal and might have taken steps to mitigate the risk. Exhibit CPSD-9 at 90. CPSD determined that PG&E personnel at Milpitas had little recognition that they were working with a very critical system that demands a high level of care in planning and execution of their work. Exhibit CPSD-1 at 98. CPSD concludes that by failing to account for abnormal conditions in its work procedures manual, PG&E

violated 49 CFR Part 192.605(c). PG&E alleges this is a one-time violation that occurred on September 9, 2010.

PG&E argues that this alleged violation is duplicative of the clearance procedure violation discussed in Section 5.3.2. PG&E Reply Brief at D-14. However, the former violation pertains to the requirement to follow work procedures whereas the instant violation pertains to the requirement to have procedures in place that would prepare an operator to deal with enumerated abnormal conditions. The underlying requirements are separate and distinct, and the alleged violation are likewise separate and distinct.

When asked if PG&E's WP 4100-10 requires written pre-work planning for abnormal events, PG&E's witness answered in the negative. 2 Jt. Tr. 149. PG&E violated 49 CFR Part 192.605(c) by failing to establish adequate written procedures for maintenance and operations activities under abnormal conditions. While, arguably, the required procedures should have been in place prior to the date of the San Bruno pipeline rupture, we accept CPSD's allegation that this violation occurred on September 9, 2010.

5.3.5. Milpitas Terminal Conditions

CPSD contends that while the local control system at Milpitas Terminal had been upgraded multiple times from the original manual system to a fully automated terminal, the upgrade modifications were not always executed properly. Exhibit CPSD-1 at 94. According to CPSD, this resulted in poorly made electrical connections, improperly labeled circuits, missing wire identification labels, aging and obsolete equipment at the end of its useful life, and inaccurate documentation. *Id*. Noting that scheduled replacement of equipment before the end of its expected lifetime is necessary to maintain integrity of safety related control systems, CPSD contends that PG&E's past

practices have been to monitor and react rather than predict and be proactive. Exhibit CPSD-5 at 42. CPSD asserts the following as examples of PG&E's failures in maintaining the Milpitas Terminal:

- Power Supplies. The UPS for the control system had failed at least once before February 2010. Exhibit CPSD-5 at 44. It had been in service since the late 1980s and parts were no longer available so it had to be replaced, yet it remained in operation until it failed. *Id*. PG&E did not replace either the UPS or the 24 Volt DC power supplies at Milpitas until after they aged into the "wearout failure period" for aging equipment. *Id*. at 43. The PS-A and PS-B 24-volt power supplies were about 21 years old, well past the time they should have been replaced. *Id*. at 44. The capacitors in those power supplies have a 100,000 hours nominal lifetime, which equates to 11.4 years under continuous use. *Id.* To be safe, these power supplies should have been replaced routinely at least every 10 years. *Id*.
- Pressure Controllers. On the afternoon of September 9, 2010 a gas technician noticed that three controllers had failed to return to normal operation. Exhibit CPSD-1 at 87. The pressure controllers suffered a rare type of malfunction and the manufacturer had to be contacted to advise how to correct it. *Id.* at 88.
- Loose wires and poorly made electrical connections. Loose wire connections with sparks were found inside the control panel during the work on the day of the incident. Exhibit CPSD-5 at 46. Additional loose wires and wiring situations were found inside the control panel when the UPS upgrade was completed in October. *Id*. Terminals were found with more wires forced on them than they were designed to hold. *Id*. The risk of forcing more wires under a terminal than it is designed to hold is that some of the wires can come loose, spark or short. *Id*.
- Improperly labeled circuits. Ambiguous labeling on the circuit breakers led to confusion about which circuit breaker fed the two components of the chromatograph. Exhibit CPSD-5 at 46. This led to the technician working on the wrong one for a time. *Id*. Floorboards were raised to trace the wires to see what they were

connected to. *Id*. Proper documentation should have included markers on the wires and well as identification of the circuits, breakers and terminals. *Id*. The fact that the crew had to raise the floor boards to trace out the wiring shows that they did not or could not rely on documentation. *Id*.

- Missing and inaccurate identification labels. The wire identification labels were present on only some of the wiring in the control system. Exhibit CPSD-5 at 47. The remaining identification labels were those dated from the original construction about 1989. *Id*. Power supplies PS-A and PS-B, are identified on the PG&E drawings as PS-1 and PS-2, but as PS-A and PS-B on the equipment. *Id*. Wires in the control system were not identified as required by electrical standards, yet industry practice is to identify the conductors inside a control panel with tags or colors that correspond with the engineering documentation. *Id*.

- Inaccurate documentation and equipment identification. Wiring from circuit breaker panels to the items of equipment were not identified on the drawings and/or the technicians did not have enough confidence in it to refer to it. Exhibit CPSD-5 at 47. Pre-existing document errors were identified in the redlined as-built drawings for the UPS upgrade. *Id*. When the UPS upgrade was completed in October 2010, the drawings were redlined to show the corrections necessary to make them agree with the existing installation. *Id*. at 47-48.

- Errors in the Milpitas operations and maintenance document. The document contains numerous references to a VAX computer that was removed from service in 2001. Exhibit CPSD-5 at 48. It also has a reference to the ADACS SCADA system that had been removed from service before September 9, 2010. The manual for Milpitas maintenance had not been correctly updated for nine years at that time of the incident. *Id*.

CPSD concludes that over decades of updates and revisions to the controls and SCADA at Milpitas, the integrity of documentation, wiring connections, identification of electrical components, and the equipment itself had deteriorated

and increased the chance of an incident. Exhibit CPSD-1 at 98. CPSD alleges that by poorly maintaining a system at Milpitas that had defective electrical connections, improperly labeled circuits, missing wire identification labels, aging and obsolete equipment, and inaccurate documentation, PG&E created an unreasonably unsafe system in violation of Section 451. CPSD alleges this as a continuing violation that ran from February 2010 to September 9, 2010.

PG&E contends that the alleged deficiencies at Milpitas Terminal did not result in a loss of pressure control or delay response to the rupture, as the backup pressure limiting system functioned as designed to keep the pressure on Line 132 below MAOP and regulatory maximums. PG&E Opening Brief at 97. PG&E also notes that the Milpitas Terminal was upgraded in 2002 with replacement PLCs with the latest technology and upgraded software, upgraded valve controllers, and upgraded communication between the PLCs and controllers. Exhibit PG&E-1 at 8-11. PG&E notes the power supplies did not show signs of degradation at that time. *Id*.

PG&E refers to the testimony of witness Kazimirsky, who stated that he thought the Milpitas terminal equipment was in good shape and well maintained, and neither dangerous or obsolete. 2 Jt. Tr. 113. However, such a generalized assertion does not overcome the numerous deficiencies found by CPSD, as listed above. Also, the 2002 upgrades at Milpitas Terminal noted by PG&E do not negate the deficiencies found by CPSD.

While we do not find that CPSD has proven that the Milpitas Terminal pressure controllers were dangerous, CPSD has proven that the overall condition of equipment at the Milpitas Terminal was unsafe due to the use of electrical equipment (power supplies) beyond the time when such equipment was reliable (*i.e.*, in the "wearout failure period"), loose wires and poor electrical connections

inside a control panel, improperly labeled circuit breakers, missing and inaccurate wire identification labels inconsistent with electrical standards, and inaccurate documentation. These constitute unsafe conditions in violation of Section 451. The fact that the monitor valves kept the pressure on Line 132 below its MAOP on the date of the rupture does not change the unsafe nature of these conditions. PG&E notes that CPSD does not rely on objective standards to determine that the Milpitas Terminal conditions were unsafe, but CPSD is entitled to rely on the expert testimony of its engineers to draw such conclusions.

The unsafe conditions at Milpitas Terminal clearly did not occur suddenly on September 9, 2010, but accrued over time. Accordingly, we concur with CPSD that it is reasonable to calculate the continuing violation from February 2010, when PG&E asked an engineer to offer a proposal and provide recommendations for UPS/battery problems at the Milpitas Terminal. CPSD did not specify a date in February 2010 when the proposal was requested. We therefore determine that the violation began on February 28, 2010.

5.3.6. SCADA Alarm Design

CPSD notes that PG&E's SCADA system is programmed to alarm when the pressure exceeds the MAOP or if the value is less than a preset low level. It does not provide automatic control or intelligent alarming functions such as high rate of change alarms. Exhibit CPSD-1 at 73. On September 9, 2010 the SCADA center received multiple alarms of increasing pressures on lines leaving the Milpitas Terminal. *Id*. at 89. The SCADA center alarm console displayed over 60 alarms within a few seconds, including controller error alarms and high differential pressure and backflow alarms from the Milpitas Terminal. These alarms were followed by pressure alarms on several lines leaving the Milpitas Terminal, including Line 132. *Id*. at 11.

CPSD's investigation of the SCADA system led it to the following findings:

- The "glitches" and anomalies that the gas operators' encounter in their SCADA data have caused them to be extra cautious when observing unusual data in order to give themselves time to assess whether that data is "real."
- The gas operators are burdened with too many unnecessary alarm messages that increase the risk of an important alarm not being correctly handled.
- The design of the controls at Milpitas and of the SCADA system did not take advantage of redundant pressure data available in the system to increase reliability and safety.
- The SCADA system does not incorporate a leak or rupture recognition algorithms. Such a system would require more and closely spaced pressure sensors. Exhibit CPSD-1 at 98-99.

CPSD alleges that by maintaining a SCADA system that gave too many unnecessary alarm messages to its operators, and was generally poorly designed, increasing the risk of an important alarm being mishandled, PG&E created an unreasonably unsafe system in violation of Section 451. CPSD alleges this as a continuing violation that ran from 2005 to the date of the rupture.

We do not find that CPSD has provided adequate evidentiary support for this alleged violation. Even if operators become "extra cautious" when observing unusual data, we are not persuaded that constitutes an unsafe condition in violation of Section 451. The number of unnecessary alarms appears likewise to be an issue to be addressed by all operators, but we are not persuaded that PG&E's alarm design created an unreasonably unsafe condition.[60]

[60] PG&E notes that the issue of alarm management confronts the industry as a whole, as reflected in recently–effective Control Room Management regulations.

Footnote continued on next page

Finally, we note that CPSD alleges that this violation began in 2005, but it does not show why the SCADA system was not so unsafe as to constitute a Section 451 violation prior to that date, but only beginning in 2005.

5.4. PG&E's Emergency Response Procedures and Actions

5.4.1. Overview

While finding that the emergency response by the City of San Bruno was "prompt and appropriate," the NTSB Report noted that PG&E took 95 minutes to stop the flow of gas and isolate the rupture site after the rupture occurred. Exhibit CPSD-9, Executive Summary at x. The NTSB characterized this response time by PG&E as "excessively long" and determined that it "contributed to the extent and severity of property damage and increased the life-threatening risks to the residents and emergency responders." *Id*. The NTSB also determined that "PG&E lacks a detailed and comprehensive procedure for responding to large-scale emergencies such as a transmission pipeline break, including a defined command structure that clearly assigns a single point of leadership and allocates specific duties to supervisory control and data acquisition staff and other involved employees." *Id*. CPSD asserts that "PG&E's confusion during [the 95 minutes it took to isolate the rupture] is directly related to its failure to maintain and follow good emergency planning." CPSD Opening Brief at 61.

CPSD alleges 21 violations related to PG&E's emergency response plans and its actions on September 9, 2010. Six are alleged as continuing violations that ran from August 31, 2009 to September 9, 2010 and 15 are alleged as one-time

---

Exhibit PG&E-1 at 8-13. PG&E agrees that alarm management is an area where its SCADA system can be improved. *Id*.

violations that occurred on September 9, 2010. Twenty are alleged as Title 49 CFR violations and one is alleged as a Section 451 violation.

PG&E acknowledges that its emergency response plans could be improved but, with one exception, denies that its emergency plans or its response to the disaster on September 9, 2010 violated any laws. For example, PG&E's Director of Incident Command testified that "I don't believe there were deficiencies. I believe there were some gaps that we wanted to continue to improve on …" 5 Tr. 328. PG&E admits that it failed to timely conduct an alcohol test.

As we evaluate whether violations of emergency response laws occurred as alleged by CPSD, we focus on alleged systemic failures by PG&E. In doing so, we recognize that individual PG&E employees took initiative to respond to the developing disaster, and we commend them for their performance. We note CPSD's assertion that "[b]ut for PG&E employees who acted on their own initiative and outside the corporate chain of command, PG&E's response would have been even worse." CPSD Opening Brief at 66. We also note the testimony of PG&E witness Miesner that "the real sort of person that deserves a lot of credit in this whole thing was the PG&E employee who was so attuned to his job and so attuned to what he was doing, that he was able to self-dispatch, get his crew … and shut those valves …" 10 Tr. 864. To the extent that PG&E is found to have violated safety laws in its emergency response procedures and actions, that does not detract from the performance of those employees on September 9, 2010.

5.4.2. General Emergency Response Issues

5.4.2.1. Federal Emergency Response Regulations

Title 49 of the CFR includes the following provisions for which CPSD alleges emergency response violations by PG&E:

- 49 CFR 192.605 – Procedural Manual: As noted in Section 5.3.1, 49 CFR 192.605(a) requires operators to prepare and follow a manual of written procedures for conducting operations and maintenance activities and for emergency response. Paragraph (c) states that for transmission lines, the required manual shall include enumerated procedures to provide safety when operating limits have been exceeded.
- 49 CFR 192. 615 – Emergency Plans: Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency, including at a minimum 11 enumerated conditions or activities (Paragraph (a)); furnish supervisors a copy of the procedures, train personnel, and review employee activities for effectiveness (Paragraph (b)); and establish and maintain liaison with fire, police, and other public officials (Paragraph (c)).
- 49 CFR 192.616 – Public Awareness: Paragraph (a) provides that operators must develop and implement a written continuing public education program that follows the guidance provided in the American Petroleum Institute's (API) Recommended Practice (RP) 1162. Paragraph (d) provides that the program must include provisions to educate the public, government organizations, and persons engaged in excavation regarding enumerated conditions and activities.
- 49 CFR 199.105 – Drug Tests Required: Paragraph (b) requires operators to conduct post-accident drug tests.
- 49 CFR 199.225 – Alcohol Tests Required: Paragraph (a) requires operators to conduct post-accident alcohol tests.

5.4.2.2. Continuing Emergency Response Violations

As noted above, CPSD alleges that 6 of 21 emergency response violations were continuing violations that ran from August 31, 2009 to September 9, 2010. CPSD Opening Brief, Revised Appendix C at 7-9. These include CPSD's allegations that PG&E: (1) failed to create and follow adequate emergency plans, (2) had inconsistent plans, (3) failed to create mutual assistance agreements,

(4) failed to plan for mutual assistance, (5) had an inadequate emergency manual, and (6) failed to have proper liaison with local first responders.

The CPSD Report, CPSD's rebuttal testimony, and CPSD's Opening Brief do not address or provide reference to evidence that any of these alleged continuing violations began on August 31, 2009 or any other date. The CPSD Report notes that PG&E's Emergency Plan consists of two parts—the basic plan and an appendix containing District/Division-specific information. Exhibit CPSD-1 at 117. The CPSD Report also notes that the Basic Plan is reviewed by a PG&E subject matter expert by August 31 of each year. *Id*. However, this evidence is insufficient to support CPSD's assertion of continuing emergency response violations dating from August 31, 2009. Accordingly, to the extent that the above-noted violations are proven by CPSD, they will be assessed as one-time violations occurring on September 9, 2010.

5.4.2.3. CPSD Audits

PG&E notes that in the two years preceding the San Bruno explosion and fire, CPSD audited PG&E's emergency procedures and deemed them to be satisfactory under the regulations at issue (49 CFR 192.605(c) and 49 CFR 192.615). These audits included a 2009 audit of PG&E's operations, maintenance, and emergency plans and a 2010 audit of the Peninsula Division that included a review of emergency procedure. Exhibit PG&E-1 at 10-2.

As we noted in addressing PG&E's claims regarding integrity management audits by CPSD and PHMSA (see Section 5.2.2.2 above), an Operations, Maintenance and Emergency Plan audit is a procedures-focused audit that might find procedural compliance even though there are underlying violations. When asked "[i]f CPSD doesn't catch or they overlook something in an audit, can't PG&E still be held in violation of the law?" PG&E emergency

response witness Almario answered in the affirmative. 5 Tr. 332. The fact that CPSD audits of PG&E's emergency plans deemed PG&E's emergency procedures satisfactory does not relieve PG&E of the obligation to comply with applicable federal and state safety regulations.

5.4.2.4. Duty to Follow Emergency Response Plans

PG&E asserts that while 49 CFR 192.615 prescribes the elements to be included in written emergency plans, it does not regulate emergency response actions themselves. PG&E Reply Brief at 89. In other words, according to PG&E's argument, an operator's failure to follow the emergency plan required by 49 CFR 192.615 does not constitute a legal violation as long as the plan itself is in place.

However, the federal regulations clearly anticipate that an operator may not simply prepare an emergency manual with all the proper components and file it away. As we noted in Section 5.3.1, 49 CFR 192.13 (c) requires operators to maintain, modify as appropriate, *and follow* the plans, procedures, and programs that it is required to establish under Part 192. Also, 49 CFR 192.605 (e) provides that the procedural manual required by 49 CFR 192.605 (a) must include the procedures required by 49 CFR 192.615, and 49 CFR 192.605 (a) requires operators to prepare *and follow* the procedural manual.

We note that PG&E's emergency response witness Bull concluded that "the actions described in the NTSB and CPSD Reports demonstrated multiple actions taken in accordance with PG&E's plan and that, in turn, fulfilled responsibilities set forth in § 192.615." Exhibit PG&E-1 at 11-25. Thus, PG&E's witness acknowledged that 49 CFR 192.615 does not merely provide a list of

required emergency plan elements; it also creates "responsibilities" to act in accordance with those plan elements in an emergency.

Finally, we note that failure of a utility to follow mandated emergency plans that are intended to ensure greater safety in the event of an emergency would be an unsafe practice in violation of Section 451.

Thus, emergency response actions are regulated in that required emergency plans must be followed. Failure to do so is a legal violation.

5.4.2.5. Notice of Alleged Emergency Response Violations

The CPSD Report noted that "the federal safety requirements for gas operators are stated in Part 192. Parts pertaining to emergency response include subparts 605 and 615, and 616." Exhibit CPSD-1 at 113. The CPSD Report alleged actions by PG&E that violated these CFR provisions but it did not identify subsections thereof. *Id*. at 113-125.

PG&E contends that the CPSD Report "discussed vaguely PG&E's emergency plans and response, but did not identify specific aspects of PG&E's emergency response or plans as violating particular subsections of 49 CFR 192.615." PG&E Reply Brief at 90. PG&E is claiming that by specifying for the first time in its opening brief subsections of 49 CFR 192.615 that were violated, CPSD is alleging new violations. PG&E goes on to state that "[i]n some instances, CPSD introduced topics in its opening brief that were not mentioned at all in [the CPSD Report] or [CPSD's] rebuttal testimony addressing emergency response." *Id*. at 90-91.

As we discussed and determined in Section 4.5.4 above, CPSD's approach of identifying in its opening brief subsections of CFR sections discussed in the CPSD report does not amount to a misleading change of legal theory that would

violate PG&E's due process rights. We will not strike alleged violations solely on the basis that subsections of 49 CFR 192.615 were first identified by CPSD in its opening brief. We are, however, prepared to dismiss alleged violations for which the underlying fact patterns were first identified in the CPSD opening brief.

5.4.3. Alleged Violations of Emergency Response Requirements

5.4.3.1. Plan Inconsistencies

CPSD asserts that PG&E's company-wide emergency response plan and the district/division plans are not always in concert with each other. In support, CPSD refers to the IRP finding that:

> There appears to be fragmentation in coordination between the corporate [emergency response plan] and those at the Divisional level. The plans are structurally different in look and feel. This could be a source of confusion during emergencies.
> Exhibit CPSD-10 at 77.

CPSD goes on to note the IRP Report's finding that some gas transmission lines transverse several Divisional territories, and that without clear physical segment assignment, confusion could result during a major event. *Id*. CPSD also notes that the Peninsula District plan has four levels of emergency response escalation, while the company-wide plan has only three levels of escalation. *Id*. CPSD argues that such incompatible guidance can lead to a disorganized and ineffective response to an emergency, and alleges that the inconsistencies between corporate and divisional level emergency plans violate the legal requirement in 49 CFR 192.615(a)(3) for a "prompt and effective response" to an emergency notice.

PG&E contends that CPSD failed to raise this topic and the associated alleged violation in its testimony. PG&E also contends that any inconsistency in the plans does not constitute a violation of the law.

We do not sustain this alleged violation. The IRP Report's statement that the plans' differences in look and feel could cause confusion does not provide adequate notice that CPSD was alleging this violation. The CPSD Report itself does not address facts underlying this violation. Moreover, CPSD has not provided evidence sufficient to prove that it was inconsistencies in PG&E's corporate-wide and Division/District emergency plans that prevented a prompt and effective response by PG&E to notice of the emergency.

5.4.3.2. Mutual Assistance Agreements

PG&E's Peninsula Division emergency plan has a section for External Mutual Assistance Agreements. Exhibit CPSD-297 at F-2.1. With regards to such agreements, it states it has "none in written form." *Id*. CPSD alleges that PG&E violated both 49 CFR 192.615(a)(8) and 49 CFR 192.615(c)(4) by failing to have a mutual assistance agreement with local first responders.

49 CFR 192.615(a)(8) requires operators to establish written procedures for notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency. 49 CFR 192.615(c)(4) requires operators to establish and maintain liaison with appropriate fire, police, and other public officials to plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

In these alleged violations, CPSD is not asserting that PG&E failed to have and follow written procedures for notifying local first responders of emergencies and coordinating responses, or that it failed to establish and maintain liaison

with local first responders. Rather, CPSD is asserting that PG&E failed to have written mutual assistance agreements with the local agencies. However, CPSD has not established that a written mutual assistance agreement with local first responders is required to comply with either Paragraph (a)(8) or Paragraph (c)(4) of 49 CFR 615. As PG&E witness Bull testified, plans with local agencies can be codified in a memorandum of understanding but "[o]ftentimes they're training sessions that the company engages in with the various member response agencies. It can also be coordinated through emergency response exercises and drills." 5 Tr. 423. He also explained that a mutual assistance agreement would cover, for example, a situation where a "fire department was capable of conducting some sort of covered task for the gas company and by saying none in written form that would indicate that the gas company has not entered into any mutual aid agreements allowing other agencies to conduct covered tasks on their system to help operate their system." *Id*. at 426-7.

Because CPSD has not established that an operator must have written mutual assistance agreements to comply with 49 CFR 192.615(a)(8) and 49 CFR 192.615(c)(4), we do not sustain these alleged violations.

5.4.3.3. Operational Awareness and Internal Communications

5.4.3.3.1. Events of September 9, 2010

Under the headings "Operational Awareness and Control" and "Internal Communications," CPSD's opening brief describes various events of September 9, 2010 and alleges that PG&E's emergency response actions violated six provisions of 49 CFR 192.615(a) and 49 CFR 192.605(c)(1) and (3). CPSD

Opening Brief at 66-75. The facts asserted by CPSD in support of these seven alleged violations include the following:[61]

- Based on a review of PG&E's Gas Control Operator Logs, there appears to have been a significant amount of confusion as to the location of the incident, its severity and the mitigation efforts required. Exhibit CPSD-10 at 76.
- An event timeline drawn from Exhibit CPSD-1 (at 11-12, 101) and Exhibit PG&E-40 (at 5, 7, 8, 11) shows that Gas Control was confused and not in control of the situation. While one operator believed Line 132 had a break in it within minutes, other operators continued to believe Line 132 did not break. At 6:51 p.m. Gas Control informs a PG&E employee it is not a transmission line, two minutes later Gas Control says it is Line 132, and two minutes later after that Gas Control says it is not a transmission line.
- Even after Gas Control was confident that Line 132 had a break, PG&E did not know the location of the rupture and made the choice to not decrease the pressure, which had the effect of feeding the fire. Gas Control states at 6:49 p.m., "We are going to feed the line break at this pressure but I would take the pressure down if I know more about what was feeding it …" Exhibit CPSD-9 at 101.
- At times PG&E employees thought it might have been an airplane crash (Exhibit PG&E- 40 at 10; Exhibit CPSD-1 at 108, 110), a gas station explosion (Exhibit PG&E-40 at 7), or a break in their distribution lines (Exhibit CPSD-9 at 101).
- The NTSB concluded that limitations in PG&E's SCADA system contributed to its delay in recognizing there had been a transmission line break and where it was located. Exhibit CPSD-9 at 102.

[61] This list is drawn from a somewhat lengthier list of facts asserted by CPSD in its opening brief. CPSD Opening Brief at 66-74.

- PG&E's ability to respond was hampered by a SCADA malfunction and the fact there are fewer than optimal SCADA pressure points on its transmission system adding to a delay in determining the location of the incident. Exhibit CPSD-10 at 78.
- At about 6:15 p.m., as PG&E was confronted with the Milpitas Terminal anomalies, low pressure alarms at the Martin Station, and reports of a fire in San Bruno, communications between the SCADA center staff, the dispatch center, and various other PG&E employees, the roles and responsibilities for dealing with such emergencies were poorly defined.[62] Exhibit CPSD-9 at 98.
- A timeline of events drawn from Exhibits CPSD-1 (at 108-112), CPSD-9 (at 17), and PG&E-40 (at 7, 12) demonstrates that internal communication was muddled and uncoordinated. Various actors acted at cross purposes with others; no clear line of command was established. Several points illustrate this lack of effective communication: (1) it is unclear which if any supervisor was ultimately in charge; (2) when the first supervisor (San Francisco Transmission and Regulation (T&R) Supervisor) is contacted by Gas Control (21 minutes after the explosion) they have to leave a message; (3) When that supervisor calls back (at 6:36) he tells them to call a different supervisor (Peninsula Division T&R Supervisor); (4) it is the Peninsula On-Call Supervisor that calls the Measurement and Control (M&C) mechanics to go to the Colma Yard (approximately 4.5 miles from the break) who, fortunately, were in the process of self-reporting to the Colma Yard when they got the call; (5) when a GSR wanted to let PG&E know he was on site he called two different supervisors; (6) when the SF T&R Supervisor told Gas Control he had crews responding he told them they "might" be headed to

[62] CPSD asserts that emergency response requires a coordinated effort by PG&E's employees, including: Gas Control Operators who are responsible for using the SCADA system to monitor and operate the pipeline system; Dispatch which is responsible for sending personnel wherever needed; Gas Service Representatives (GSRs) who are the field responders to gas situations; and various levels of management, who assist as needed and hold authority to authorize acts by other PG&E personnel.

the Martin Station; (7) it was the Peninsula Supervisor that approved the mechanics' plan to shut off the valves; (8) it was the Troublemen Supervisor who required all Colma Yard employees to report in; and (9) it was the SF T&R Supervisor who requested that Gas Control remotely lower the pressure at the Martin Station.

- While PG&E's procedures mentioned rules and responsibilities for the entity as a whole, there was no procedure that expressly outlined each individual's role, responsibilities and lines of communications in the event of an emergency. Exhibit CPSD-1 at 117. Multiple and redundant reports of the same emergency went through Dispatch potentially preventing critical information from being relayed. *Id*. Several Gas Control operators contacted the same supervisor without being aware that there their fellow operators had already made that contact. *Id*. at 117-118.
- Dispatch was inefficient: repeating and redundant calls to and from Dispatch impacted PG&E ability to receive other important calls. For example, describing his attempts to call PG&E Dispatch one first responder stated that "[i]t was very difficult to place a call. Multiple attempts on the cell phone were system busy, call failed." Exhibit CPSD-1 at 118. And while Dispatch did learn of the explosion at 6:18 p.m., they did not send anyone to check it out till 6:23 p.m. Exhibit CPSD-9 at 99. The dispatch center initially dispatched only a single service representative (at 6:23 p.m.) to assess the scene and did not immediately dispatch a qualified crew to shut off valves. *Id*.
- PG&E Dispatch had (1) dispatched a GSR and called that GSR to check in at 6:30 (Exhibit PG&E-40 at 7), (2) confirmed their on-site presence at 6:41 p.m. (*id*. at 10), and (3) told San Bruno Police they were on-site (*id*.), and (4) had further confirmation of PG&E on-site at 7:22 p.m. (*id*. at 11). Yet, at 7:22 p.m., Dispatch states when asked if GSR have been dispatched to San Bruno "we haven't heard anything yet." *Id*. at 12. A minute later, when Concord Dispatch is asked by a GSR if "guys" are being sent to San Bruno, Dispatch states "they haven't said anything yet." *Id*. Again at 7:31 p.m. Dispatch tells a caller when asked if GSRs are

needed at San Bruno, that they haven't gotten any calls [requesting GSRs]. *Id*.

- Despite numerous calls between Dispatch, Gas Control, and various PG&E employees, Dispatch never sent any employee out to expressly shut off the valves. Exhibit CPSD-9 at 99.
- Gas Control was similarly ineffective. The geographic monitoring responsibilities of the Gas Control staff were arbitrary. Exhibit CPSD-1 at 117. Staff decided which regions they preferred to observe at any particular time, potentially leaving gaps in coverage while other areas received redundant coverage. *Id*. at 118. Moreover, Gas Control Operators were unequally aware of the situation and received and shared conflicting information as to what was occurring at the site. *Id*. The lack of assigned roles and responsibilities resulted in SCADA staff not allocating their time and attention in the most effective manner. Exhibit CPSD-9 at 98. They did not initially notice the dropping pressure at the Martin Station after the rupture, but rather were alerted by staff at the Brentwood SCADA facility. *Id*. Several SCADA operators contacted the same SCADA transmission and regulation supervisor (supervisor 6), but seemed unaware that the senior SCADA coordinator had already made contact with the supervisor. *Id*. Further, the low pressure alarms at Martin Station were initially acknowledged by two SCADA coordinators. *Id*.
- Gas Control spent a significant portion of their time during the first 90 minutes after the rupture providing telephone briefings and updates to various PG&E employees and officials. Exhibit CPSD-9 at 98. They also received multiple calls about opening of various emergency response centers. *Id*. These calls were handled by whichever control was available and were done so without any command structure. *Id*. The NTSB found it would have been beneficial to have a sole point of contact for the Milpitas Station so others would be free to monitor the rest of the system. *Id*.
- Each SCADA staff member was left to form his or her own impression as to the nature and severity of the rupture based on the information they had, resulting in some conflicting and

erroneous assessments. Exhibit CPSD-9 at 98. Operator B and Operator C continued to have conflicting view of what was happening--Operator B thought there was a break in Line 132 within minutes but Operator C thought it was a distribution line. *Id*. at 101.

- PG&E's supervising engineer, who is responsible for all SCADA and control systems, exhibited a lack of training and preparedness. After going home for the day, he contacted Gas Control at 6:51 p.m. requesting information, and called again at 7:19 p.m. to say that Milpitas Terminal workers said they did not need his help, and when Gas Control suggested he go to Milpitas he declined. Exhibit CPSD-9 at 99. He eventually showed up at Milpitas Terminal at 9:00 p.m. *Id*.
- There was confusion as to who specifically had the authority and responsibility to order that specific valves be closed. The local operating supervisor has the authority to dispatch crews to shut off mainline valves in cases of emergencies. Exhibit CPSD-1 at 120. Gas Control also has emergency authority to close valves. *Id*. Yet, in responding to the incident, the Peninsula On-Call Supervisor claimed that he did his duty by telling mechanics to head in the direction of the valves because someone else would tell the mechanics which valves to shut and if it was okay to shut the valves. *Id*. at 121. In fact, the mechanic stated that after the Peninsula On-Call Supervisor told him to go the Colma Yard to begin staging, the mechanic himself came up with a plan as to what valves to shut. *Id*. He formulated this plan based on his familiarity with the system and with information from TV news, not with information provided by Gas Control or Dispatch. *Id*. After shutting off the valves nearest to the south of the break, the mechanic took it upon himself to head to the valves north of the break and shut them off. *Id*.
- The M&C Superintendent stated that when the battalion chief told him to shut off the gas because it was hampering rescue and firefighting efforts, he was told by the Senior Distribution Specialist that his transmission supervisor for San Francisco was on it. Exhibit CPSD-1 at 122. That person was "very confident that they were going to have the transmission valves for that area

> secured shortly … I fully trusted [the SF Division T&R Supervisor] to do the right thing [and make the decision to ask someone to send personnel to close the valves]." *Id*. Yet the SF T&R Supervisor claims that no one directed the crew to shut off the valves, and they acted on their own. *Id*. The battalion chief's request was approximately 6:30-6:35 p.m. *Id*. At that time the mechanics were either at or driving to the Colma Yard, where they would wait until their plan to shut off the valves was approved by the Peninsula Division T&R Supervisor about thirty minutes after the battalion chief requested the valves be closed.

CPSD concludes that PG&E's response to the Line 132 break lacked a command structure with defined leadership and support responsibilities within the SCADA Gas Control center; execution of the PG&E emergency plan resulted in delays that could have been avoided by better utilizing the SCADA center's capability; and PG&E lacked detailed and comprehensive procedures for responding to a large-scale emergency such as a transmission line break, including a defined command structure that clearly assigns a single point of leadership and allocates specific duties to SCADA staff and other involved employees. Exhibit CPSD-9 at 99.

Using a different lens, PG&E looks at its response to the emergency and asserts that it was "reasonable, adequate, effective and prompt." PG&E Opening Brief at 107, citing the testimony of witnesses Almario (5 Tr. 269), Bull (5 Tr. 415-16), and Miesner (10 Tr. 861-2). Disputing the NTSB's conclusion that 95 minutes to stop the flow of gas by isolating the rupture site was excessive, PG&E notes that even CPSD acknowledges that a "multitude of variables" are present in responding to an emergency, providing as examples "the severity of the leak, vintage and material of the pipe, weather and traffic conditions, proximity to nearby personnel and equipment, utility resources, and the time of day." Exhibit CPSD-1 at 107.

PG&E asserts that at the time of the San Bruno accident, it had written procedures that provided for the prompt and effective response to an incident occurring near or directly involving a pipeline facility. PG&E also notes that David Bull, an expert on emergency response plans and the federal regulations, found that its emergency response plans contain each of the elements required by 49 CFR 192.615 and were in compliance with the regulation. In support of its contention that it responded appropriately, PG&E asserts that:

- It initiated its response immediately after becoming aware of the event a few minutes after the rupture. It dispatched multiple field personnel and coordinated on scene with the fire Department. 5 Tr. 415-16. It responded as soon as it became aware of the event and began dispatching resources. *Id*. Within seven minutes of the rupture, at 6:18 p.m., PG&E's dispatcher began receiving calls about the incident. Exhibit PG&E-40 a 6; 5 Tr. 377-78. Five minutes later, at 6:23 p.m., PG&E's dispatcher had gathered information and dispatched a gas service representative to Sneath Lane and Skyline Boulevard in San Bruno to investigate the reported explosion. Exhibit PG&E-40 at 6. It was rush hour and there was traffic. 5 Tr. 380-81. At 6:25 p.m., PG&E's dispatcher contacted the Peninsula Division On-Call Supervisor, who then began making call outs of more field personnel. *Id*. at 381-82; Exhibit PG&E-40 at 8. PG&E's dispatch also called Gas Control at 6:27 p.m. Exhibit PG&E-40 at 7.
- PG&E's personnel including those not on duty acted promptly and effectively. At 6:35 p.m., a PG&E M&C mechanic saw the fire from his house and headed immediately to PG&E's Colma Yard to retrieve a truck and tools. 5 Tr. 382-85, 392-93; Exhibit PG&E-40 at 8. The M&C mechanic recognized through his training and experience that the fire was consistent with a fire fueled by natural gas. 10 Tr. 864; Exhibit CPSD-96 at 6, 10-14. While en route, five minutes later at 6:40 p.m., the M&C mechanic was contacted by the Peninsula Division On-Call Supervisor, who instructed him to report to the Colma Yard. 5 Tr. 382; Exhibit PG&E-40 at 9. Already on his way, the M&C

mechanic continued to the yard, arriving at 6:50 p.m. Exhibit PG&E-40 at 10; 5 Tr. 389-90. He arrived and gathered his tools and maps. *Id*. at 390. He also spoke with his supervisor about the plan to isolate the rupture; the supervisor approved the plan and directed that it be carried out. *Id*. at 391; Exhibit PG&E-40 at 11. Another M&C mechanic had also been directed to report to the Colma Yard. *Id*. at 9. (Two mechanics are needed to shut the valves, which often are large, difficult to turn and isolated underground. 5 Tr. 391-92.) At 7:06 p.m., the two M&C mechanics left the yard to close valves and isolate the rupture. Exhibit PG&E-40 at 11; 5 Tr. 3931; Exhibit CPSD-96 at 10-25.

- The M&C mechanics arrived at the first valve location at 7:20 p.m. and closed the valve by 7:30 p.m. Exhibit PG&E 40 at 11-12; 5 Tr. 393. At 7:29 p.m., Gas Control remotely closed the valves at Martin Station, isolating the pipeline north of the rupture but several miles distant. Exhibit PG&E-40 at 12. The two M&C mechanics, joined by a T&R Supervisor, traveled to and closed two additional valves north of the rupture, isolating the rupture at the closest possible locations. Exhibit PG&E-40 at 13.

Not all facts asserted by CPSD regarding PG&E's emergency response necessarily lead to or reflect a violation. For example, a SCADA malfunction or a suboptimal number SCADA pressure points would not necessarily reflect a deficiency in PG&E's emergency response plan. Also, while the record shows there was confusion among PG&E personnel, confusion in and of itself is not a violation. The question is whether PG&E had in place and followed an appropriate, effective emergency response plan that would prevent and/or mitigate the impact of confusion.

Still, when viewed as a whole, the detailed fact pattern established by CPSD demonstrates persuasively that PG&E's emergency plan and overall response were inadequate and contributed to delay in isolating the rupture. PG&E's review and interpretation of what are, in large part, the same facts relied

on by CPSD do not overcome CPSD's conclusions that PG&E's response lacked a command structure with defined leadership and support responsibilities within the SCADA Gas Control center; execution of the PG&E emergency plan resulted in delays that could have been avoided by better utilizing the SCADA center's capability; and PG&E lacked detailed and comprehensive procedures for responding to a large-scale emergency such as a transmission line break, including a defined command structure that clearly assigns a single point of leadership and allocates specific duties to SCADA staff and other involved employees. PG&E was not adequately prepared to respond effectively to the Line 132/San Bruno emergency on September 9, 2010.

We recognize that there is not an objective standard for emergency response time. In some circumstances an operator's response time of 95 minutes might be reasonable, and in other circumstances it would be unreasonable. Here, we conclude that the 95 minutes that it took PG&E to isolate the rupture site was excessive because, as CPSD has shown, "the response time for shutting off the valves to isolate the rupture would have been reduced if PG&E had created and followed better procedures resulting in clearer internal coordination and decision making." Exhibit CPSD-1 at 107. The record evidence does not enable us to determine with precision how much time could have been saved with a more prompt and effective response by PG&E, but we do not need to reach that finding. It is clear that precious minutes were lost due to inadequate emergency plans and actions. PG&E's gas system was feeding a catastrophic fire in San Bruno, and every minute that it continued to do so perpetuated an unsafe situation. To the extent that inadequate PG&E's emergency procedures caused any delay in isolating the rupture, the response was not prompt and effective.

PG&E's overall response was not as prompt and effective as it could and should have been.

5.4.3.3.2. Prompt and Effective Response

49 CFR 192.615(a) requires each operator to establish written procedures to minimize the hazard resulting from a gas pipeline emergency. CPSD alleges that PG&E violated Subparagraph (3) of 49 CFR 192.615(a), which requires that the written emergency procedures shall provide for prompt and effective response to each type of emergency, including an explosion occurring near or directly involving a pipeline facility.

As discussed above, PG&E's response to the emergency on September 9, 2010 was not as prompt and effective as it could and should have been. PG&E's slow and uncoordinated response to the explosion violates the requirement of 49 CFR 192.615(a)(3) for an operator to respond promptly and effectively to an emergency by having and following plans for doing so. This violation occurred on September 9, 2010.

5.4.3.3.3. Notices of Emergency

CPSD alleges that PG&E violated Subparagraph (1) of 49 CFR 192.615(a), which requires that the written emergency procedures shall provide for receiving, identifying, and classifying notices of events which require immediate response by the operator.

The inefficiencies in the PG&E's dispatch, including the problems a first responder had placing a call, show that PG&E did not have in place and follow adequate procedures for handling notice of the San Bruno emergency. We therefore conclude that PG&E did not adequately receive, identify, and classify notices of the emergency, in violation of 49 CFR 192.615(a)(1). This violation occurred on September 9, 2010.

5.4.3.3.4. Provision of Resources

CPSD alleges that PG&E violated Subparagraph (4) of 49 CFR 192.615(a), which requires that the written emergency procedures shall provide for the availability of personnel, equipment, tools, and materials as needed at the scene of an emergency. PG&E's initially dispatched a single gas service representative and not a qualified crew to shut off the valves, which demonstrates that PG&E did not have and follow adequate procedures to provide needed resources at the scene. Therefore, PG&E did not provide for the proper personnel, equipment, tools and materials at the scene of an emergency, in violation of 49 CFR 192.615(a)(4). This violation occurred on September 9, 2010.

5.4.3.3.5. Shutdown of Pipeline

CPSD alleges that PG&E violated Subparagraph (6) of 49 CFR 192.615(a), which requires that the written emergency procedures shall provide for emergency shutdown and pressure reduction in any section of the pipeline system necessary to minimize hazards to life or property. The litany of events over the 95 minutes it took PG&E to isolate the rupture site demonstrates that PG&E did not have in place and follow adequate procedures for emergency shutdown and pressure reduction. There was confusion as to who specifically had the authority and responsibility to order that specific valves be closed. PG&E's efforts to perform an emergency shutdown of its pipeline were inadequate to minimize hazards to life or property, in violation of 49 CFR 192.615(a)(6). This violation occurred on September 9, 2010.

5.4.3.3.6. Making Hazards Safe

CPSD alleges that PG&E violated Subparagraph (7) of 49 CFR 192.615(a), which requires that the written emergency procedures shall provide for making safe any actual or potential hazard to life or property. CPSD asserts that rather

than making safe any hazards to life or property, PG&E's response made them worse. PG&E's feeding of the fire due to delays in isolating the Line 132 rupture clearly made the hazards worse at the scene, in violation of 49 CFR 192.615(a)(7). This violation occurred on September 9, 2010.

5.4.3.3.7. Notification of First Responders

CPSD alleges that PG&E violated Subparagraph (8) of 49 CFR 192.615(a), which requires that the written emergency procedures shall provide for notification of appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency.

Although it did not call 911 on September 9, 2010, PG&E points out that police and fire were on the scene rapidly so it was not necessary to do so. However, the fact some fire fighters and police officers were at the scene quickly, does not mean there was no need for further communication. There are several reasons why PG&E should have called 911, and its failure to do so was dangerous and in some cases non-compliant with its own emergency plans:

- Coordination between PG&E and external agencies by telephone was only initiated by the external agencies. Exhibit CPSD-1 at 118. San Bruno Police called PG&E at 6:54 p.m., San Mateo County Sheriff called PG&E at 7:02 p.m., and San Mateo County Fire Department called PG&E at 7:59 p.m. *Id*.
- PG&E was not on site until 30 minutes after the explosion. 5 Tr. 406. First responders were on site one minute after the explosion. Exhibit PGE-40 at 5. Thus, for 29 minutes, important conversations between PG&E and first responders did not happen. PG&E acknowledged that PG&E personnel were not present on site to give emergency responders the benefit of PG&E's insight into the potential gas transmission ruptures. 5 Tr. 405– 406. PG&E also acknowledged that knowledge that the

possibility a fire is being fed by a high pressure natural gas line is relevant and necessary to first responders. *Id* at 355.

- As noted earlier, one first responder stated it was very difficult to place a call to PG&E Dispatch. Exhibit CPSD-1 at 118.
- San Bruno first responders were not aware of the location or specifications of PG&E's pipelines. 5 Tr. 345.
- PG&E's Dispatch, not just on-site personnel, are directed to contact police, fire and other emergency responders, under section 3.3.2 of the Company Plan. Exhibit PGE-39 at 1-28.
- While PG&E Dispatch did send PG&E's employees to the site, they did not simultaneously call the local fire department as required under various sections of their own emergency plan. 5 Tr. 359-60; Exhibit PGE-39 at 1-40, sec. 4.4.1 and 1-47, sec. 5.8.2.
- PG&E did not call the California Highway Patrol as required under its emergency response plan. 5 Tr. 421– 422.
- PG&E's Transmission and Distribution Emergency Plan listed 911 as emergency contact information for incidents involving the Milpitas Station. Exhibit PGE-42 at 85-86; 5 Tr. 419– 420.

The fact that City of San Bruno's first responders arrived at the scene promptly did not remove PG&E's responsibility under its own plans to notify appropriate first responders. PG&E's failure to notify the appropriate first responders of an emergency and coordinate with them violated 49 CFR 192.615(a)(8). This violation occurred on September 9, 2010.

5.4.3.3.8. Adequacy of Procedural Manual

Subparagraph (c)(1) of 49 CFR 192.605 require that operators of transmission lines include in their required procedural manuals, for when operating design limits have been exceeded, procedures for responding to and correcting the cause of unintended closure of valves or shutdowns, increase or decrease in pressure or flow rate outside of normal operating limits, loss of

communications, operation of any safety device, and any other foreseeable malfunction of a component, deviation from normal operation, or personnel error, which may result in a hazard to persons or property. Subparagraph (c)(3) requires the inclusion of procedures for notifying responsible operator personnel when notice of an abnormal operation is received. CPSD alleges that PG&E violated both Subparagraphs (c)(1) and (c)(3) of 49 CFR 192.605 by failing to have an emergency manual that properly directed its employees to respond to and correct the cause of Line 132's decrease in pressure, and its malfunction which resulted in hazards to persons and property, and notify the responsible personnel when notice of an abnormal operation is received.

The confusion and lack of coordination discussed in Section 5.4.3.3.1 demonstrate that PG&E did not both have and follow adequate procedures for responding to a change of pressure outside normal operating limits and for adequately notifying appropriate personnel. We therefore uphold CPSD's allegation that PG&E violated 49 CFR 192.605(c)(1) and (3) by failing to have an emergency manual that properly directed its employees to respond to and correct the cause of Line 132's decrease in pressure, and its malfunction which resulted in hazards to persons and property, and notify the responsible personnel when notice of an abnormal operation is received. Although CPSD alleged this as a continuing violation, as discussed above CPSD did not show when, prior to September 9, 2010, the violation began. We therefore determine that the violation occurred on that date.

5.4.3.4. External Communications

5.4.3.4.1. Introduction

Under the heading "External Communications" in its opening brief, CPSD alleges three violations of 49 CFR 192.615.[63] CPSD Opening Brief at 75-76. CPSD asserts the following as factual support for these alleged violations.

First, as noted above in Section 5.4.3.3.7, PG&E made no outgoing calls to fire or police officials upon discovery of the incident and important conversations between PG&E and first responders did not happen for 29 minutes; PG&E's Dispatch, not just on-site personnel, are directed to contact first responders, yet it did not simultaneously call the local fire department as required under various sections of the emergency plan when it sent employees to the site; PG&E did not call the California Highway Patrol as required under its emergency response plan; and PG&E's T&D Emergency Plan listed 911 as emergency contact information for incidents involving the Milpitas Station. CPSD also notes that PG&E's emergency response plans and manuals required calling 911 (Exhibit PG&E-1 at 10-6, 11-18), yet a Gas Control operator said that, "no outside agencies are called unless the supervisor out in the field requests it." Exhibit CPSD-1 at 119. CPSD notes further that PG&E agrees that 911 notifications needed to be tied to SCADA alarms. Exhibit PG&E-1 at 10-6; 5 Tr. 319.

[63] CPSD's statement of alleged violations at page 76 of its opening brief includes a fourth violation: "PG&E failed to notify appropriate fire, police, and other public officials of a gas emergency and coordinate with them, in violation of 49 CFR Part 192.615(a)(8)." We understand this to be a restatement by CPSD of the violation discussed earlier in CPSD's brief (at 68, 75) and discussed in Section 5.4.3.3.7 above.

5.4.3.4.2. Communication With Local First Responders

CPSD alleges that PG&E violated Subparagraph (2) of 49 CFR 192.615(a), which requires that the written emergency procedures shall provide for establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials. The fact that PG&E did not contact 911 demonstrates that PG&E did not have and follow adequate procedures for establishing and maintaining communication with local first responders. This violation of 49 CFR 192.615(a)(2) occurred on September 9, 2010.

5.4.3.4.3. Protection Priorities

CPSD alleges that PG&E violated Subparagraph (5) of 49 CFR 192.615(a), which requires that the written emergency procedures shall provide for actions directed toward protection people first and then property. None of the facts referenced by CPSD in support of its alleged "external communications" violations supports the assertion that PG&E failed to protect people first then property. We therefore do not uphold this alleged violation

5.4.3.4.4. Liaison With Local First Responders

CPSD alleges that PG&E violated 49 CFR 192.615(c)(4), which requires that operators establish and maintain liaison with appropriate fire, police, and other public officials to plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

CPSD has not provided evidence sufficient to prove that PG&E did not adequately establish and maintain liaison with local first responders. We have already noted that such liaison may take forms other than written mutual assistance agreements. (See Section 5.4.3.2.) Also, the San Bruno fire chief stated

that PG&E's coordination efforts were "great." Exhibit PG&E 41 at 469. We therefore do not uphold this alleged violation.

5.4.3.5. Training and Public Awareness

5.4.3.5.1. Emergency Response Training

CPSD notes that PG&E's GSRs have no specific training as to how to recognize the difference between fires of low-pressure natural gas lines, high-pressure natural gas lines, gasoline or jet fuel lines, or how to tailor the response to each of these types of fires. Exhibit CPSD-1 at 123. This lack of training is evident by the events on September 9, 2010, CPSD claims. An off-duty, offsite GSR called Dispatch at 6:21 p.m. stating it appeared the fire was gas fed because it sounded like a jet engine. Exhibit PG&E-40 at 6. However, another GSR who was on site called Dispatch at 6:41 p.m. (30 minutes after the break) and informed Dispatch that the Peninsula On-Call Supervisor did not yet know the cause of the flames. *Id*. at 10. CPSD notes that when told faulty information by the Dispatch that it was a plane crash into a gas station, the GSR did not have the information or knowledge to correct Dispatch. *Id*. CPSD also notes that none of the first three PG&E first responders were qualified to operate mainline valves. Exhibit CPSD-9 at 15; 5 Tr. 314. PG&E's employees would benefit from additional training on how to recognize and respond to different types of fires, as would first responders. Exhibit CPSD-1 at 123.

CPSD alleges that PG&E's inadequate training resulted in a slow and ineffective recognition of the incident, in violation of 49 CFR 192.615(a)(3); that PG&E failed to train the appropriate operating personnel to assure they are knowledgeable about procedures and verify that the training is effective, in violation of 49 CFR 192.615(b)(2); and that PG&E failed to train its employees

and determine whether procedures were effectively followed in emergencies, in violation of 49 CFR 192.615(b)(3).

PG&E notes that CPSD's testimony highlighted areas where its training could be improved but did not allege any violations regarding its training. PG&E also notes that it has now developed training to address the issue of fire identification.

Even though it has been established that PG&E failed to have and follow adequate emergency plans, and its response was therefore less than prompt and effective in violation of 49 CFR 192.615(a)(3), CPSD not established that inadequate training is a separate and distinct violation of the requirement to have and follow written procedures for prompt and effective response to an emergency. We therefore do not uphold the alleged violation of 49 CFR 192.615(a)(3).

49 CFR 192.615(b)(2) requires operators to train the appropriate personnel to assure they are knowledgeable of the emergency procedures and verify that the training is effective. Even though GSRs may not have been given training regarding different types of fires or tailoring a response to the type of fire, CPSD has not established that knowledge of fire types is a required emergency plan procedure, and, therefore, that Subparagraph (b)(2) of 49 CFR 192.615 required such training. Accordingly, we cannot determine that PG&E violated this requirement.

49 CFR 192.615(b)(3) requires operators to review employee activities to determine whether the procedures were effectively followed in each emergency. We understand this provision to require a post-emergency review. CPSD has not shown that PG&E failed to conduct a post-incident review of its employees'

activities to determine whether the procedures were followed in the San Bruno emergency. We therefore do not find that PG&E violated this requirement.

5.4.3.5.2. Reviews of Effectiveness

CPSD asserts that PG&E's management does not appear to take past company experiences seriously, noting that when PG&E's Director of Incident Command was asked if he was aware of NTSB's finding that the first responders for the Rancho Cordova explosion were not properly trained, he said he was "not aware of that." 5 Tr. 312-313. He admitted that there were lessons to be learned from Rancho Cordova but stated, "I don't have the detailed understanding of what those lesson were." *Id.* at 315-316. CPSD alleges that PG&E violated 49 CFR 192.605 (c)(4), which requires an operator's procedural manual to include procedures for periodically reviewing the response of operator personnel to determine the effectiveness of the procedures controlling abnormal operation and taking corrective action where deficiencies are found.

While it is troubling that PG&E's Director of Incident Command was not aware of the NTSB's findings regarding the Rancho Cordova explosion, we do not find that constitutes sufficient evidence to uphold CPSD's alleged violation of 49 CFR 192.605 (c)(4).

5.4.3.5.3. Public Awareness

49 CFR 192.616(d) requires that the written continuing public education program required by Paragraph (a) must include provisions to educate the public, appropriate government organizations, and persons engaged in excavation regarding:

- Use of a one-call notification system prior to excavation and other damage prevention activities;

- Possible hazards associated with unintended releases from a gas pipeline facility;
- Physical indications that such a release may have occurred;
- Steps that should be taken for public safety in the event of a gas pipeline release; and
- Procedures for reporting such an event.

CPSD notes that San Bruno first responders were not aware of the location or specifications of PG&E's pipelines. Exhibit CPSD-1 at 124; 5 Tr. 345. CPSD also notes that the NTSB has recommended that PHMSA require pipeline operators to share system-specific information, including pipe diameter, operating pressure, product transported, and potential impact radius with first responders. Exhibit CPSD-1 at 124-25.

CPSD notes that to comply with the federal requirement, PG&E developed a Public Awareness Program which is documented in the company's Public Awareness Plan. Exhibit CPSD-1 at 124. However, CPSD alleges that PG&E did not educate the public and governmental organizations as to hazards associated with unintended releases on a gas pipeline and steps that should be taken for public safety in the event of a gas pipeline release, in violation of 49 CFR 192.616(d).

CPSD acknowledges that PG&E had a public awareness program, but, in support of this alleged violation, asserts that San Bruno first responders were not aware of the location or specifications of PG&E's pipelines. That evidence suggests there may have been a deficiency in PG&E's public awareness program prior to the San Bruno explosion and fire, but it is not sufficient to prove a violation of 49 CFR 192.616 (d).

5.4.3.6. Drug and Alcohol Testing

5.4.3.6.1. Milpitas Terminal Employees

49 CFR 199.225(a) states that as soon as practicable following an accident, the operator shall test each employee for alcohol if that employee's performance either contributed to the accident or cannot be completely discounted as a contributing factor to the accident. 49 CFR 199.225(a)(2)(i) further requires that if the alcohol test is not administered within two hours following the accident, the operator shall prepare and maintain on file a record stating the reasons why the test was not promptly administered; and if the test is not administered within eight hours following the incident, the operator shall cease attempts to do so. PG&E failed to meet the two-hour window for administering an alcohol test to the employees involved in the incident, and failed to file a record stating the reasons why the test was not promptly administered. Both inactions are a violation of 49 CFR 199.225(a). Alcohol testing of four Milpitas Terminal employees commenced at 3:10 a.m. and concluded at 5:02 a.m. on September 10, 2010. Exhibit CPSD-9 at 104. The accident occurred at about 6:11 p.m. on the previous evening. Therefore, alcohol testing should have been completed by 2:11 a.m. on September 10, at the latest. *Id*. Accordingly, the use of alcohol as a factor in the San Bruno accident cannot be excluded. *Id*.

PG&E agrees that it failed to conduct prompt alcohol testing of the operators doing the Milpitas work, in violation of 49 CFR 199.225. PG&E Opening Brief at 105; PG&E Reply Brief at 112.

PG&E violated 49 CFR 199.225(a) by failing to perform alcohol tests on the employees involved within 2 hours of the incident, and failing to record the reasons for not administering the test in a timely fashion. This violation occurred on September 9, 2010.

5.4.3.6.2. Gas Control Staff

The NTSB noted its concern that PG&E did not conduct any drug or alcohol testing of its SCADA staff. Exhibit CPSD-9 at 105. For the first time in its opening brief, CPSD asserts that PG&E's failure to drug- and alcohol-test all personnel whose performance cannot be completely discounted as a contributing factor is a violation of 49 CFR 199.225(a) and 49 CFR 199.105(b).

CPSD did not allege this violation in its testimony. We do not find that the NTSB's statement of concern constitutes adequate notice that CPSD was alleging this violation. Moreover, CPSD does not specify which Gas Control staff should have been tested and why. We therefore do not uphold this alleged violation.

5.4.3.7. Unsafe Conditions Due to Emergency Response Deficiencies

CPSD alleges that PG&E's failure to create and follow good emergency plans created an unreasonably unsafe system in violation of Public Utilities Code Section 451. We concur. The numerous violations of CFR requirements to create and follow adequate emergency plans, discussed in Section 5.4.3.3, demonstrate that PG&E allowed unsafe conditions to exist in creating and following emergency response plans. This violation occurred on September 9, 2010.

5.5. PG&E's Safety Culture and Financial Priorities

5.5.1. Overview

CPSD alleges that PG&E created an unreasonably unsafe system in violation of Section 451 by continuously cutting its safety-related budgets for GT&S. CPSD Opening Brief at 83; *see* also Appendix B at 8. CPSD asserts that the GT&S budget cuts caused (1) a reduction in the replacement of PG&E's aging transmission pipeline by spending significantly less than the Commission had authorized through its approved funding of its GPRP and ending the

transmission replacement part of its GPRP prematurely well before its original goal; (2) PG&E's not seeking sufficient funds for its O&M, and then spending less than the amount it sought from the Commission, including using less effective and lower cost integrity management methods, such as ECDA over ILI; and (3) PG&E's reducing its safety-related workforce. *Id*. CPSD further asserts that during the same time period[64] PG&E provided bonuses or "incentives" to management and employees, claimed that cost savings would accrue to the shareholders, paid quarterly cash dividends to shareholders from retained earnings, repurchased stock from PG&E Corporation or from a PG&E subsidiary, expended funds to enhance its public perception and to affect ballot initiatives. *Id*.

PG&E asserts that CPSD has not alleged a violation based on its claims about PG&E's safety culture or financial priorities but has, instead, identified a long list of issues that allegedly contributed to the San Bruno accident.

5.5.2. Notice of Alleged Violation

The CPSD Report included a 36-page discussion entitled "Safety Culture" that addressed a range of topics, including PG&E's fiscal priorities, the company's image and political influence, and elements of an ethical organizational culture. CPSD asserted, among other things, the following:

- PG&E Company leadership viewed its responsibility of providing safe and reliable natural gas service as contingent

[64] CPSD's proposed Conclusion of Law 55, which specifies this violation, does not indicate the time period referenced. CPSD Opening Brief, Appendix B at 8. Revised Appendix C of CPSD's opening brief (at 10) clarifies that this is alleged as a continuing violation running from January 1, 1998 to September 9, 2010. We understand this is the time period referenced by CPSD.

upon the Commission authorizing rate recovery. Exhibit CPSD-1 at 130.

- Referring to a report of an audit conducted by Overland Consulting on its behalf (Overland Report), CPSD states PG&E was unable to identify requests for the recovery of costs for safety improvements that the Commission denied. *Id*. at 131.
- PG&E has focused on decreasing operational costs over the past 15 years at a minimum. *Id* at 132.
- The audit revealed a low rate of increase in safety-related operations and maintenance expenses. Overall safety-related operations and maintenance expenditures increased at an annual rate of 4.1% because of the pipeline safety law. Transmission pipeline maintenance increased at an average rate of 1.2% between 1997 and 2009, even though maintenance requirements increase as facilities age. *Id*. at 133-34.
- PG&E acknowledged cost constraints in its integrity management program. The audit showed that PG&E reduced integrity management expenses in three ways to meet its expense budgets in 2008, 2009 and 2010. *Id*. at 134.
- PG&E Company's 2009 Investor Conference presentation included a slide on "Expenditures," which showed decreasing investments in gas transmission infrastructure; from $250 million in 2009 to $200 million in 2010. *Id.* at 135.
- The IRP concluded that the capital investment by PG&E in the gas transmission pipeline system has been minimal. The IRP found that there was no plan to modernize the system and seek opportunities to improve the risk associated with operating the system. Instead, the focus was to provide funding to ensure compliance with the proscriptive aspect of the Pipeline Integrity rules. *Id*.
- Even with the reduction in revenue requirement [for operating costs in its 2007 general rate case], PG&E still under-spent its adopted functional operations and maintenance amount by $2.9 million in 2006, $2.2 million in 2007, and $3.5 million in 2008. *Id*. at 137.

In Section X of the CPSD Report ("PG&E's Violations of Applicable Laws and Regulations"), CPSD states:

> As discussed throughout this report, PG&E did not maintain a safe condition on Segment 180 of Line 132 in San Bruno, California. Many factors contributed to the unsafe condition, including … management failing to foster a culture that valued safety over profits at PG&E. These factors all contributed to the explosion and fire at San Bruno on September 9, 2010, and together constitute an unreasonably unsafe condition on Segment 180 that lasted from 1956 to 2010, in violation of Public Utilities Code Section 451. Exhibit CPSD-1 at 162.

Notwithstanding the examples noted above, and other statements in CPSD's testimony (including the Overland Report) indicating the alleged violation as well as the facts being asserted in support thereof, PG&E claims that it did not receive adequate notice of the alleged budget cutting violation. PG&E Reply Brief at 22-25. PG&E claims that CPSD's opening brief is alleging a new violation.[65] *Id*.

The CPSD report alleged that PG&E placed profits over safety, which contributed to an unsafe condition that lasted 54 years in continuing violation of Section 451. Exhibit CPSD-1 at 162. CPSD's opening brief alleges that PG&E violated Section 451 by cutting its safety-related budgets for GT&S over a period of 13 years. Essentially, CPSD has narrowed the scope of the violation by

---

[65] PG&E characterizes the "new" alleged violation as "fail[ing] to place safety over profits." PG&E Reply Brief at 22, referring to Revised Appendix C of CPSD's opening brief. However, CPSD makes clear in Revised Appendix C that "[t]he violations described in Appendix C are intended to be a shorthand reference to the violations in Appendix B." CPSD Opening Brief, Revised Appendix C at 1. As noted in Section 5.5.1 above, CPSD's proposed Conclusion of Law 55 is CPSD's allegation that PG&E violated Section 451 by cutting its safety-related budgets for GT&S. Of course, budget cutting and profit maximizing are not unrelated.

reducing the time frame from 54 to 13 years. It has also clarified the allegation by deemphasizing the concept of "management failing to foster a culture that valued safety over profits" and using the narrower and more precise concept of budget cutting. Yet, CPSD's testimony, including the quotes above and Chapters 6-9 of the Overland Report, clearly addressed allegations of safety-related budget cuts leading to unsafe conditions in violation of Section 451. Accordingly, we do not find that CPSD's reframing of the alleged violation contravenes PG&E's right to adequate notice.

5.5.3. Imputed/Adopted Safety-Related Costs

Much of the debate regarding CPSD's alleged "safety culture/financial priorities" violation centers on CPSD's allegation that, from 1997 to 2010, PG&E spent significantly less on safety-related costs, including capital expenditures, than was provided for in Commission-approved rates during that period. CPSD claims that PG&E's actual gas transmission functional O&M expenses[66] during the period 1997 to 2010 were $981.1 million, or $39.9 million less than adopted expenses of $1.021 billion over that 14 year period. Exhibit CPSD-170 at 7, Table 3-2. CPSD also claims that PG&E's actual gas transmission capital expenditures during the same period were $1.616 billion, or $116.7 million less than adopted capital expenditures of $1.733 billion. *Id*. at 8, Table 3-3. PG&E in contrast claims that its expenditures exceeded adopted amounts. According to PG&E, GT&S's actual O&M expenditures of $1.101 billion exceeded imputed

[66] The Overland Report states that "functional O&M" refers to gas gathering, transmission and storage O&M as defined by the Federal Energy Regulatory Commission Uniform System of Accounts. Exhibit CPSD-168 at 3-1, Footnote 1. It notes that those functions contain PG&E's gas safety expenses. *Id*.

adopted amounts of $1.058 billion by $43.1 million over the 1997-2010 time period (Exhibit PG&E-10 at 2) and GT&S's actual capital expenditures of $1.617 billion exceeded imputed adopted amounts of $1.355 billion by $262 million during the same period. *Id*. at 4.

For all but one of the years studied (2004), the Commission adopted rate case settlements for GT&S in lieu of determining adopted O&M and capital expenditures. CPSD's and PG&E's witnesses attempted, in effect, to reverse-engineer the amounts adopted for O&M and capital expenditures through a series of judgments to arrive at "imputed/adopted" amounts. As CPSD witness Harpster acknowledged, there is not a "nice neat cost of service model with every settlement." 5 Tr. 69.

We do not find that the methodologies employed by CPSD's and PG&E's witnesses support any determination of whether PG&E underspent or overspent on gas transmission safety O&M and capital expenditures relative to amounts adopted by the Commission in setting rates. Accordingly, for 1997 to 2003 and 2005 to 2010, we are not able to make findings whether PG&E spent less or more on O&M and capital expenditures for GT&S than amounts adopted in setting rates. Moreover, even if we had been able to do so, we note that CPSD's analysis of capital expenditures for 1997 to 2002 did not break down safety versus non-safety expenditures (5 Tr. 82) and its analysis of O&M expenditures did not break down safety versus non-safety expenditures because PG&E's accounting system does not isolate solely safety-related expenditures (*id*. at 83-85).

GT&S rates for 2004 were the result of a litigated rate case which resulted in a Commission decision (D.03-12-031). CPSD notes that CPSD's and PG&E's witnesses largely agree that PG&E underspent by approximately $70 million the amount of O&M and capital expenditures compared to what the Commission

explicitly adopted as forecasts. CPSD Reply Brief, referring to Exhibit CPSD-170 at 7-8, 14-15. Again, we note the caveat that O&M expenditures are not broken down by safety versus non-safety expenditures.

5.5.4. Did PG&E Reduce Safety Spending in Violation of Section 451?

While we do not resolve the parties' dispute over PG&E's spending on safety relative to amounts authorized by the Commission in setting rates, we note that determination of CPSD's alleged budget cutting violation does not depend on such resolution. The question is whether PG&E decided to spend less on safety than it should have to maintain safe facilities and practices. As PG&E witness O'Loughlin acknowledged, the authorized revenue requirement and the amount PG&E should spend on reliable and safe service are unrelated:

> What's in the settlement revenue requirements as being the amount provided for in the settlement revenue requirement is what it is. 8 Tr. 616.
>
> And I'm not trying to say that gee, if 50 million was provided for in the settlement revenue requirement, that's all PG&E needed to spend or should have spent. It might have made sense to spend more. It might have made sense to spend less. I think those are two independent questions or two independent items. *Id*.

The unrebutted testimony of CPSD witness Harpster (Exhibit CPSD-168, Chapters 6-9) documents how PG&E significantly reduced funding and the corresponding priority for safety of PG&E's gas pipeline system, particularly in the three years leading up to the San Bruno explosion and fire. We note the following examples.[67]

[67] The following list is taken from pages 84-91 of CPSD's opening brief. In the interest of brevity evidentiary citations included in the brief are omitted here.

Staffing, operational metrics, deferral of projects and maintenance:

- Maintenance work generally increases as a gas system ages and throughput increases. But from 1998 to 2010, PG&E reduced the GT&S union headcount for maintenance workers from a peak of 302 to 220. Reduction of the union workforce by nearly 25% directly conflicts with PG&E's stated goal in 1985 to retain knowledge within the organization for long-term operations and planning.
- PG&E's workforce for gas distribution decreased by 28% between 1996 and 2010. PG&E discovered serious safety-related deficiencies in its gas distribution operations during 2007-2009. This reduction in workforce had negative implications for local transmission gas pipeline safety.
- PG&E did not monitor the miles of pipeline it leak-surveyed on a centralized basis, and maps and logs were stored at each local headquarters. PG&E cannot provide actual leak survey mileage statistics for its entire backbone or local transmission systems.
- Under the GPRP, PG&E committed to replacing 15 miles of transmission pipeline a year. However, in 2000, PG&E replaced the transmission portion of the GPRP with its Pipeline Risk Management Program (PRMP). If the GPRP had remained in place, PG&E would have been required to replace 165 miles of transmission pipeline during 2000-2010. Instead, PG&E replaced only 25 miles of transmission pipeline under the PRMP.
- From 2001-2006, PG&E repaired most, if not all, of the leaks reported for its backbone transmission system. From 2007-2010, with the exception of 2008 when approximately 60% were repaired, PG&E only repaired 50% or less of the leaks reported.
- After 2004, PG&E's PRMP existed in name only. PG&E ceased preparing annual reports for its PRMP in 2008. PG&E did not prepare separate risk management plans or track risk management projects.
- PG&E did not track the corrective work request backlog prior to November 2003. The days in backlog increased by 54 days

between 2004 and 2010, reflecting a 33% increase in the backlog – despite a 46% decrease in corrective work orders issued.

- In October 2009, PG&E suspended the performance of corrosion maintenance work for the remainder of the year, deferring it to 2010 so that crews could repair the large number of leaks discovered in leak re-surveys.
- In 2009-2010, there was a large increase of leaks reported as the result of special leak surveys implemented by PG&E in response to the discovery of serious systematic deficiencies in its leak survey program and the San Bruno explosion.
- In 2010, PG&E adopted what it called the "Reduce Pipeline Project Work" initiative, the stated purpose of which was to defer all project work that was not required by code or contractual obligation to "2011 or beyond."
- Preparing for the May 2010 CPUC audit of PG&E's Integrity Management program consumed about two-thirds of Integrity Management's time for six months. The amount of effort required to prepare for the audit is an indication of the large backlog of incomplete work, presumably attributable to staffing shortages.

Integrity management assessments:

- According to PG&E's Fall 2000 California Gas Transmission (CGT) Capital Program Review, PG&E's PRMP was designed specifically to attempt to justify less expensive alternative methods to "verify" pipe integrity in lieu of In-Line Inspection (ILI), such as smart pigging, or hydro-testing in order to save "millions of dollars."
- The PG&E corporate focus on cheaper integrity assessment methods again was manifest in PG&E's spring 2001 CGT Capital Program Review, which acknowledged then pending federal legislation language as potentially requiring smart pigging or hydro-testing, which could cost "in excess of $200 million over a 10-year period." PG&E expected to save approximately $150 million over the 10- year period by using cheaper

assessment methods and using the Risk Management program as a means to reduce PG&E's costs, instead of PG&E's safety risks.

- During 2005-2008, ILI accounted for 54% of the total miles of pipeline assessed by PG&E. But in 2009 and 2010, ILI only accounted for 13% of the total miles assessed.
- Total ILI miles assessed by PG&E averaged 125 miles a year between 2005 and 2008. In 2009 and 2010, the annual average fell nearly 100 miles, to 26 miles per year.
- As of 2004, PG&E primarily used External Corrosion Direct Assessment (ECDA) as its integrity assessment method. However, in contrast, PG&E knew in February 2004 that Southern California Gas Company "made a business decision to primarily utilize ILI as their integrity assessment method" and was "proposing to pig approximately six times the mileage under the Pipeline Safety Rule than PG&E."
- From 2001-2010, PG&E used the ECDA method to assess 437 miles of the HCA (High Consequence Area) pipelines and only used ILI inspections for 181 HCA pipeline miles.
- In 2008, PG&E reduced Integrity Management expense by changing assessment methods for some projects from ILI to ECDA and deferring some projects to 2009. The 2008 Gas Transmission Expense Program Review documents that PG&E ignored the advice of its own engineers: "Gas Engineering would strongly prefer to smart pig PG&E's higher stress pipelines to obtain a much better initial evaluation of the line, but that is not financially viable at current funding rates."
- Like 2008, PG&E reduced Integrity Management spending in 2009 by changing assessment methods for projects from ILI to ECDA to reduce costs by $6 million and by deferring 41 miles of assessments until 2010. The 2009 budget was considered to be the minimum funding, combined with increases in 2010-2012, to maintain the feasibility to comply with the United States Department of Transportation 2012 inspection deadline.
- In 2010, PG&E adopted a cost-saving initiative to change integrity management assessment methods from ILI to ECDA to

create, in its own words, "headroom" in 2011 and 2012 in order to allow PG&E to "push more work" to those years.

- PG&E hydrotested only 14 miles of its existing pipeline during 2003 to 2010.

Sustained underfunding for pipeline safety:

- The PRMP was viewed internally by PG&E as a cost-reduction measure. Over the life of the originally planned GPRP program (to 2009), PG&E expected the PRMP would yield a total of $60 million dollars in savings.
- GT&S was under significant pressure to reduce expenses in 2008. The combined Maintenance and Integrity Management budgets were $23.2 million below the GT&S's budget request.
- Actual 2008 Integrity Management spending was 30% below the initial GT&S request.
- The 2008 approved budget only funded 76% of the GT&S Maintenance budget request.
- The 2008 budget request for maintenance projects was $25.2 million. The approved maintenance project budget was 47% below the initial GT&S request. PG&E bluntly acknowledged in its Fall 2007 Program Review that its "long-term reliable operation is jeopardized at the current level of funding," that reduced spending "will perpetuate significant underfunding of the gas transmission maintenance program," and the backlog of correction maintenance would grow.
- PG&E's 2008 Gas Transmission Program Review documents PG&E's recognition that since 2007 "many high priority reliability projects were underfunded/postponed." PG&E also tragically predicted: "While the effects of deferred maintenance can immediately impact operations and reliability, effects are most impactive when maintenance is deferred over a multiple year period as will likely be the case in 2008 to 2010."
- According to a PG&E internal email, in 2009 – the year before the San Bruno explosion – GT&S was "saddled" by its management with an Integrity Management expense budget set

32% below GT&S's initial budget request. And PG&E actually spent even less – $1.9 million less than the final approved budget amount.

- PG&E's approved budget in 2009 for pipeline maintenance was $7.1 million less than the amount requested.
- PG&E's 2009 budget cuts for maintenance were, in GT&S's own words, "very deep," leaving GT&S unable to fund all Priority I work.
- PG&E's Spring 2009 Expense Program Review notes that $6.4 million of Priority I and II maintenance projects remained unfunded. PG&E acknowledged the risks of not funding these projects: deferral of critical maintenance, reliability impacts and reduced efficiency.
- In 2009, PG&E actually spent $60.3 million on pipeline maintenance – $6.3 million over budget – but only because of significant unplanned emergent repair work. PG&E then implemented cost reduction measures to close the "budget gap" caused by the unplanned expenditures, including strict hiring controls.
- GT&S was under significant pressure to reduce expenses for a third straight year in 2010. In October 2009, PG&E Vice Presidents requested an analysis of how to further reduce the GT&S 2010 budget to $89.8 million (the original projected need was $111.1 million).
- The 2010 budget was set $6.7 million below the already constrained 2009 actual expense level.
- The 2010 Integrity Management budget was 11% below the initial request, and the maintenance budget was 24% below the initial request.
- In 2010, PG&E again cut its Integrity Management budget by deferring projects, and developed 21 formal cost reduction initiatives to bridge the gap between the expense funding requested by GT&S and management's budget target.

These facts leave no question that PG&E officers and executives decided to reduce spending on natural gas transmission pipeline safety over a period of years. They reveal a corporate culture that values cost-cutting and profit maximizing ahead of safety. The integrity management program, whose purpose is to manage risk, was itself at risk due to the misplaced priorities of PG&E. The question is whether this budget cutting practice violated Section 451 as alleged by CPSD. When we consider and take to heart the Commission's pronouncement that "[o]fficers and employees of the [gas utilities] must continue to be ever conscious of the importance of safe operating practices and facilities and of their obligation to the public in that respect" (D. 61269 (1960); 58 CPUC 413, 420), we can only conclude that PG&E's budget cutting for gas transmission pipeline safety was not just the typical utility exercise of management discretion. It amounted to an unsafe practice and, therefore, a Section 451 violation

5.5.5. Continuing Violation

As noted earlier, CPSD alleges that the budget cutting violation continued from January 1, 1998 to September 9, 2010. The evidence does not support this allegation. It appears that CPSD is relying in part on its contention that PG&E underspent on safety relative to Commission-authorized revenue requirements from 1997 to 2010. However, we have not sustained that contention. In fact, most of the evidence relied upon by CPSD, as discussed in the previous section, focuses on PG&E's practices in 2008, 2009, and 2010 leading up to the San Bruno disaster. Based on the record of this proceeding, PG&E's unsafe budget cutting was at its worst during that period. We also note that three of the seven "key findings" of CPSD witness Harpster involved gas safety funding, integrity management expenses, and integrity management focus for 2008, 2009, and 2010. Exhibit CPSD-168 at 1-1. The evidence supports a determination that PG&E

continuously violated Section 451 through unsafe gas transmission budget cuts from January 1, 2008 to September 9, 2010.

6. Intervenors' Alleged Violations

6.1. Allegations Raised by TURN

TURN alleges that PG&E violated federal regulations and Section 451 by repeatedly spiking the pressure on multiple pipelines and failing to properly assess them under integrity management requirements. TURN also alleges that PG&E may have violated federal regulations by relying on external corrosion direct assessment (ECDA) to assess the majority of pipelines with identified manufacturing threats. TURN Opening Brief at 38-41.

In Section 5 of this decision we determined among other things that PG&E's practice of planned pressure increases violated Section 451 (Section 5.2.5.5) and that PG&E violated federal regulations by performing pipeline inspections using ECDA and not using a method capable of detecting seam issues (Section 5.2.4.4.3). Where CPSD focused its analysis in this proceeding on Line 132, TURN has shown that the violations affected more than just Segment 180 and Line 132. However, we do not find that TURN has supported the determination of violations separate and distinct from those noted above.

6.2. Allegations Raised by CCSF

CCSF states that it discussed all allegations under the appropriate CPSD allegation. CCSF Opening Brief at 50.

6.3. Allegations Raised by CSB

CSB contends that PG&E's emergency response violated Section 451 and 49 CFR 192.605 and 49 CFR 192.615 because it took PG&E 95 minutes to stop the flow of gas, PG&E's internal and external communications were deficient, PG&E

did not immediately recognize the break in Line 132, and core elements of PG&E's response relied on *ad hoc* assistance from off-duty employees. CSB Opening Brief at 38. CSB also contends that PG&E's public awareness program violated Section 451 and 49 CFR 192.616 because PG&E failed to call 911 and provide crucial details to first responders and because San Bruno residents were unaware of the proximity of their homes to natural gas pipelines and were provided no information about how to respond to a natural gas disaster. *Id*. With respect to PG&E's corporate culture, CSB contends PG&E violated Section 451 by its sustained inability to act in the face of well-known gas system vulnerabilities, underinvestment relative to rate case allocations and cost-cutting in gas operations, an incentive structure for executives and managers under which PG&E's stock price and financial performance matters, but operation of a safe system is not a significant factor, and disproportionate representation of financial and legal professionals in top company posts ,not engineers or individuals with front-line experience. *Id*. at 38-39.

CSB has, for the most part, alleged violations that we have addressed in Section 5. To the extent that CSB has alleged separate and distinct violations, we do not find that CSB has presented or identified evidence sufficient to support such allegations.

7. Transcript Corrections

PG&E proposes various corrections to the transcripts. *PG&E Opening Brief*, Appendix D. No parties have opposed PG&E's corrections and they are hereby accepted.

8. Conclusion

The *Table of Violations and Offenses* set forth in Appendix B compiles the violations we have determined in the foregoing discussion. Pursuant to

Section 2108, each day's continuance of a violation is a separate and distinct offense. Accordingly, for each violation, the table indicates the date or date range when the violation occurred as the basis for determining the total number of offenses committed by PG&E.

Section 2107 establishes minimum and maximum fines for each offense.[68] The minimum fine is $500. Effective January 1, 1994 the maximum fine was raised from $2,000 to $20,000 for each offense. Stats. 1993, Ch. 222, Section 1. Therefore, to enable consideration of the maximum fine in the fines and remedies decision, the table shows separately the offenses that occurred prior to, and on and after, that date.

CPSD did not specify a date in 1956 when the violations pertaining to Segment 180 construction occurred or began. Therefore, for continuing violations, we deem them to have begun on December 31, 1956 for the purpose of counting the number of offenses.

9. Assignment of Proceeding

Michael R. Peevey is the assigned Commissioner and Mark S. Wetzell is the assigned ALJ in this proceeding. ALJ Wetzell was designated the presiding officer for this proceeding in the Scoping Memo.

Findings of Fact

1. On September 9, 2010, at approximately 6:11 p.m., a 30-inch diameter natural gas transmission pipeline owned and operated by PG&E ruptured and exploded in San Bruno, California, resulting in the loss of eight lives, injuries to

[68] Section 2107 uses the term "penalty." For clarity in the fines and remedies portion of this proceeding, we use the term "fine."

58 people, destruction of 38 homes, moderate to severe damage to 17 homes, and minor damage to 53 homes.

2. Energy released by the explosion created a crater about 72 feet long by 26 feet wide. A 28-foot long section of pipe weighing approximately 3,000 pounds was ejected from the crater and landed approximately 100 feet from the crater in the middle of Glenview Drive.

3. PG&E has been on notice since 1909 that it must at all times maintain safe facilities, operations, and practices pursuant to Section 451.

4. PG&E was on notice at the beginning of this investigation proceeding that CPSD did not consider Section X of the CPSD Report to be the final and complete list of alleged violations; statements providing notice of alleged violations, including the applicable laws and regulations (Section 451, 49 CFR 192, and 49 CFR 199) and alleged acts and omissions relied upon by CPSD to allege violations, occur throughout the CPSD Report and in the OII.

5. The OII provided PG&E notice that it appeared that violations of safety laws and standards may have occurred over long periods of time, and that the Commission would consider ordering daily fines for the full duration of any such continuing violations.

6. The section of pipeline involved in the San Bruno explosion and fire was Segment 180, at Mile Post 39.28 of PG&E's Line 132, located at the intersection of Earl Avenue and Glenview Drive in San Bruno, California.

7. Segment 180 was intended to meet the design and construction requirements in effect in 1956 for a Class 3 location, which refers to any location unit that has 46 or more buildings intended for human occupancy.

8. PG&E provided a pressure log from the Milpitas Terminal dated October 16, 1968, showing a recorded pressure of 400 psig for Line 132. This

pressure log was used by PG&E as the basis for establishing a MAOP of 400 psig for Line 132.

9. Segment 180 was installed in 1956 as part of a relocation project of approximately 1,851 feet of Line 132 that originally had been constructed in 1948. The relocation of Segment 180 started north of Claremont Drive and extended south of San Bruno Avenue and moved the pipeline from the east side to the west side of Glenview Drive. This relocation was necessary because of grading associated with land development in the vicinity of the existing pipeline. The construction was performed by PG&E personnel.

10. Segment 180 originally was documented in PG&E records as being 30-inch diameter seamless steel pipe with a 0.375 inch wall thickness and having a SMYS of 52,000 psi, installed in 1956.

11. PG&E's identification of the entire length of Segment 180 as a seamless pipe was incorrect. There was no API-qualified domestic manufacturer of 30-inch diameter seamless steel pipe when the line was constructed. Segment 180 was in fact a 30-inch diameter DSAW pipe.

12. PG&E believes that except for the pup sections at the Segment 180 rupture site, the pipe was most likely produced by Consolidated Western in 1948, 1949 or 1953. According to PG&E, between 1947 and 1957, it purchased a total of 320,065 feet of 30-inch pipe from three suppliers. The pipe used for the 1956 project was assembled from multiple material procurement orders.

13. The rupture of Segment 180 began on a fracture that originated in the partially welded longitudinal seam of one of six short pipe sections, which are known in the industry as "pups."

14. PG&E records for Segment 180 did not disclose the existence of the pups, and the manufacturer of the pups is unknown.

15. An NTSB metallurgical examination determined that the yield strength values of all six Segment 180 pups were lower than 52,000 psi, which is the design yield strength for Segment 180.

16. Pup 1, the failed pup on which the facture initiated, was found to have a yield strength of only 36,600 psi, and Pup 2 had the lowest yield strength of 32,000 psi.

17. Longitudinally, Pups 1, 2 and 3 were partially welded on the seam from the outside and the weld did not penetrate through the inside of the pipe. No inside weld, required for a DSAW welded pipe, was found on the inside of the pipe. According to the NTSB metallurgical examination, the fusion welding process left an unwelded region along the entire length of each seam, resulting in a reduced wall thickness.

18. A visual examination of the pipe used for the Segment 180 pups would have detected the anomalous and defective welds. The unwelded seam defects and manual arc welds ran the entire length of each pup and were detectable by the unaided eye and/or by touch.

19. The girth welds associated with the Segment 180 pups had welding defects related to incomplete fusion, burnthrough, slag inclusion, crack, undercut, excess reinforcement, porosity, and lack of penetration.

20. The initial crack-like defect extended longitudinally along the entire length inside of the weld (the root) on Pup 1, resulting in a net intact seam thickness of 0.162 inches. With a nominal 0.375 inch wall thickness, the intact wall thickness was approximately 43% at the weld. There was also an angular misalignment on the inside of Pup 1. Given this initial defect, an additional 2.4 inch defect grew to failure. The initial crack-like defect first grew by ductile fracture (Stage 1). Then

the crack grew by fatigue (Stage 2). The final stage was the rupture of the pipe, identified as a quasicleavage fracture (Stage 3).

21. All of the pups used for Segment 180 were less than five feet in length.

22. PG&E was unable to produce records demonstrating that a strength test was performed on Segment 180 at the conclusion of its construction or at any time during its operation.

23. The NTSB report found that the calculated burst pressure estimates were 594 and 515 psig for Pup 1; 668 and 574 psig for Pup 2; and 558 and 430 psig for Pup 3, respectively. The analysis was done assuming no crack growth in the weld defect in Pup 1 and no angular misalignment of the Pup 1 longitudinal seam. Based on the pipeline characteristics associated with the pups and the Class 3 location, if a strength test had been performed to 1.4 times MAOP (400 x 1.4 = 560 psig), it is probable that the pups in Segment 180 would have failed.

24. The NTSB found that based on the yield strength test data for the Segment 180 pups, the MAOP would have been 284 psig for a class 3 location and 341 psig for a class 2 location.

25. CPSD's expert found that if PG&E had used a value of 24,000 for the yield strength on the Segment 180 pipe, it would have had an MAOP of 300 psig if the type of longitudinal seam was known and 240 psig, well below the actual pressure at which Segment 180 failed, if the type of seam was unknown.

26. The 2002 Pipeline Safety and Improvement Act was signed into law on December 17, 2002.

27. The gas integrity management rule set forth in 49 CFR 192 Subpart O specifies how pipeline operators must identify, prioritize, assess, evaluate, repair

and validate the integrity of gas transmission pipelines that could, in the event of a leak or failure, affect high-consequence areas within the United States.

28. The gas integrity management rule became effective on February 14, 2004, and operators were required to have an integrity management program in place and follow it not later than December 17, 2004.

29. An integrity management audit is largely a procedures-focused audit that might find procedural compliance even though there are underlying violations.

30. The IM integrity management regulations include requirements for threat analysis, risk ranking, assessment methods and re-assessment timetables.

31. PG&E did not always use conservative default values for pipeline segments in Line 132, when the actual value was missing or unknown.

32. PG&E did not always check the material specifications of pipeline segments in Line 132 for accuracy.

33. PG&E did not always gather all relevant leak data on Line 132 and integrate it into its GIS.

34. The investigation discovered a number of examples where data from PG&E's GIS were in error, but not discovered by PG&E, including:

a. the pipe wall thickness was an assumed value for 21.5 miles (41.75%) of Line 132;

b. the manufacturer of the pipe was unknown ("NA") for 40.6 miles (78.81%) of Line 132;

c. the pipeline depth of ground cover was also unknown for 42.7 miles (82.79%) of Line 132;

d. three values were used for the SMYS of grade B pipe: 35,000 psi, 40,000 psi, and 45,000 psi;

e. two segments with unknown SMYS were assigned values of 33,000 psi and 52,000 psi, not 24,000 psi;

f. six consecutive segments, totaling 3,649 feet, specified an erroneous minimum depth of cover of 40 feet;

g. several segments, including Segment 180, specified 30-inch-diameter seamless pipe, although there was no API-qualified domestic manufacturer of such pipe when the line was constructed; and

h. the GIS did not reflect the presence of the six pups in Segment 180.

35. PG&E did not consider known longitudinal seam cracks dating to the 1948 construction and at least one other leak, which occurred in 1988, on a long seam of the 1948 portion of pipe. Closed leak information, such as the October 27, 1988, leak, which had been repaired, was not transferred to the GIS.

36. PG&E did not incorporate and analyze all of the known history of seam leaks or test failures. A number of defects were not incorporated into PG&E's analysis of the condition of the pipe for its 2004 BAP, including the following:

a. 1948, Line 132: Multiple longitudinal seam cracks found during radiography of girth welds during construction.

b. 1958, Line 300B: Seam leak in DSAW pipe.

c. 1974, Line 300B: Hydrostatic test failure of seam weld with lack of penetration (similar to accident pipe).

d. 1988, Line 132: Longitudinal seam defect in DSAW pipe.

e. 1996, Line 109: Cracking of the seam weld in DSAW pipe.

37. PG&E's 2004 BAP did not identify a construction threat based on "wedding band" joints in its threat algorithms.

38. PG&E dismissed cyclic fatigue as a threat based on a report prepared for PHMSA on the stability of manufacturing and construction defects, and it did not incorporate cyclic fatigue or other loading conditions into the segment specific threat assessments and risk ranking algorithm.

39. PG&E increased the pressure on many lines, including Line 132, to a little over the line MAOP (referred to as "pressure spiking") so that it could eliminate the need to consider manufacturing and construction threats as unstable as a result of increasing the pressure above the five year maximum operating pressure.

40. Identifying manufacturing and construction threats as unstable would mean that an assessment method capable of assessing seam, girth weld, and other manufacturing and construction anomalies would need to be used (hydro-testing or In-Line-Inspection).

41. PG&E did not consider DSAW pipeline as having manufacturing defects, including seam and pipe body defects.

42. A report entitled Integrity Characteristics of Vintage Pipelines, referenced by PG&E in its first revision of RMP-06, identified DSAW as having manufacturing defects, including seam and pipe body defects, and it identified Consolidated Western as a manufacturer of DSAW pipe that has had incidents for both pipe body (1950 and 1954-56) and seam welds during certain years (1947, 1950, 1954-56).

43. PG&E's implementation of the ECDA process along Line 132 shows that some HCAs were identified and designated as such by PG&E before December 2003.

44. PG&E operated Line 132 to approximately 400 psig in order to establish a maximum baseline value on two occasions. PG&E operated the line at 402.37 psig on December 11, 2003; PG&E also operated Line 132 at 400.73 psig on December 8, 2008.

45. In the 2004 BAP, PG&E identified Segment 180 as not having any DSAW manufacturing threat.

46. PG&E's gas SCADA system contains several thousand monitoring and control points along PG&E's 6,438 miles of transmission pipeline.

47. SCADA is the use of computers and communications networks to gather field data from numerous remote locations, perform numerical analysis, and generate trends and summary reports. These reports are displayed in a structured format to enhance Gas Control Operators ability to monitor, forecast and send commands to field equipment. Some pipelines span long distances and are usually operated from a central location using a SCADA system. SCADA is employed for many different processes, such as management of electric power lines, operation of oil refineries, and operation of automobile assembly plants. SCADA systems make it possible to control a process that is distributed over a large area with a small group of people located in a single room.

48. About 9,000 sensors and devices are installed along the length of the pipelines to enable the display of flow rates, equipment status, valve position status, pressure set points, and pressure control among other data. The current generation of SCADA used by PG&E is based on Citect software from Schneider Electric.

49. PG&E's pipelines are controlled and managed from the Primary Gas Control Center (Gas Control) located in San Francisco. A duplicate control center is located in Brentwood. Several compressor stations and local control stations, such as the Milpitas Terminal are situated along the pipelines, each with a separate local control system.

50. The SCADA system is separate from PG&E's GIS. The GIS data are displayed on separate computer screens at each of the operator consoles at both the primary and alternate gas control centers.

51. The SCADA system is programmed to register alarms when the pressure exceeds the MAOP or if the value is less than a preset low level. The operational decisions are made by PG&E Gas Operators in charge of the consoles at the Gas Control Center.

52. Monitor valves act as limiting devices to protect against accidental overpressure for the outgoing gas pipelines. Regulator valve set points for outgoing lines can either be manually set at the Milpitas Terminal or remotely set through SCADA by PG&E Gas Control.

53. The Milpitas Terminal has four incoming natural gas transmission lines and five outgoing natural gas transmission lines and is equipped with pressure regulation and overpressure protective devices to control incoming and outgoing pressure. The pressure regulating valves are electrically actuated with the SCADA system controls while the monitor valves are pneumatically controlled valves.

54. Each of the incoming pipelines to the Milpitas Terminal has regulating and monitor valves to limit the pressure within the terminal. Pressure is further reduced with a second regulating valve and a monitor valve for overpressure protection before it is sent through the outgoing lines. The monitor valves are normally left fully open. When the downstream pressure starts to increase and exceed a pressure set point, the monitor valve moves to control the downstream pressure.

55. PG&E's gas control system at the Milpitas Terminal includes Programmable Logic Controllers (PLCs), pressure controllers and related instrumentation which communicate with the SCADA computers in San Francisco. Redundant PLCs are provided with a fail-over switch so, if one fails, the other will pick up. The PLCs communicate with the 26 pressure

controllers over a local Ethernet network. The PLCs execute a large program that calculates the flows and processes the inputs from many valve position sensors. The PLCs manage communication with the 26 pressure controllers and generate controller error alarms should a controller fail or lose communication. The PLCs also communicate commands issued by the Gas Operators located at Gas Control Center in San Francisco to control valves and to change pressure set points. Communication between the PLC software and the equipment is transmitted over individual wires connected to the PLC Input/Output devices.

56. At the Milpitas Terminal, all of the pressure instruments have a full scale range of 0 to 800 psig. The pipeline at the Milpitas Terminal is rated up to 720 psig, therefore no pressure greater than 800 psig should ever occur.

57. PG&E installed a UPS at Milpitas Terminal to power the SCADA, control, and other equipment during a power outage and before the emergency generators start delivering backup power.

58. In 2010, PG&E decided to replace the entire UPS system with a new one. The UPS at the Milpitas Terminal had been in service since the late 1980s, with a three-phase system that was no longer needed and for which parts were no longer available.

59. In February 2010, PG&E asked a Contract Engineer to offer a proposal to investigate and provide recommendations for UPS/battery problems at the Milpitas Terminal. In mid-March 2010, a Contract Work Authorization was approved for the Contract Engineer to perform the proposed work on the UPS at Milpitas Terminal.

60. On March 31, 2010, the UPS at the Milpitas Terminal failed, exposing the gas control system to a short interruption of power and potential loss of pressure control. The pneumatically operated monitor valves provided backup control.

61. On April 1-2, 2010, PG&E installed three temporary mini-UPS units at Milpitas Terminal to provide temporary backup power.

62. A clearance application to install the permanent UPS at the Milpitas Terminal was submitted on August 19, 2010 as Clearance Number MIL-10-09 and approved by PG&E Gas Control on August 27, 2010.

63. System clearance is required for work that affects gas flow, gas quality, or the ability to monitor the flow of gas. All system clearances require authorization from PG&E's Gas System Operations. PG&E Work Procedure (WP) 4100-10 issued August 2009 describes the two types of clearances required, depending on the work to be performed: (1) System Clearance and (2) Non-system Clearance.

64. PG&E's WP 4100-10 requires a designated Clearance Supervisor for all clearances at all times. Clearance application MIL-10-09 marked the Clearance Supervisor as "TBD." Under the Description box is "GC M&C remove old UPS system and install new UPS at Milpitas Terminal," with the Special Instructions box marked "Yes." The list of Special Instructions states: (1) "Technician to contact SF Gas Control prior to work and at the completion of work - Technicians will be on site with GC M&C during work," and (2) the names and contact numbers of the technicians working on the project. The checkbox on the form which asks if normal function of the facility will be maintained was checked "No." The clearance application requires an explanation whenever this box is checked "No." However, there was no explanation provided on the clearance application as to how the work will affect normal function of the Milpitas Terminal.

65. Under the Sequence of Operations, the clearance application states "Report On Daily and Report Off." It did not list any specific operations or key

communication steps to be reported to Gas Control. PG&E's Work Procedure requires the Clearance Supervisor to report key communication steps identified in the Sequence of Operations to Gas Control, including operation of any piece of equipment that affects the flow and/or pressure of gas or ability of Gas Control personnel to monitor the flow and/or pressure of gas on SCADA. One of the steps taken during the UPS work at the Milpitas Terminal was switching the controllers to manual, which locks the valve to its current setting and disables Gas Control's ability to change the valve settings remotely. This should have been clearly stated on the clearance application as a key communication step within its Sequence of Operations. Further, PG&E WP 4100-10 requires the Clearance Supervisor to fill in any steps in a system clearance with the time, date, and initials of the person completing the step and file the clearance as completed. No record was provided by PG&E showing the specific steps taken and the time, date, and initials of the person completing each step in the system clearance.

66. At 2:46 p.m. on September 9, 2010, the work to replace the temporary UPS was begun at PG&E's Milpitas Terminal.

67. Between 2:00 p.m. and 4:40 p.m., the team installed mini-UPS units 5, 6, 7 and 8. The three Ethernet Switches that connect the pressure controllers to the PLCs were also placed on mini-UPS at this time.

68. At 4:46 p.m., the PG&E Gas Technician at the Milpitas Terminal called Gas Operator 2 to let him know SCADA communication with the Milpitas Terminal would be interrupted for a few minutes while they installed Mini-UPS unit 7, the last one of the day.

69. The workers then discovered that an unidentified active circuit breaker remained in the Uninterruptible Distribution Panel (UDP). The Contract Engineer switched it off and the mimic panel went dead. After some research, he

was able to identify power supply PS-C as the one which was connected to the unidentified breaker, and powered the indicators on the mimic panel. The Contract Engineer then installed mini-UPS unit 9 to power PS-C and the mimic panel.

70. At that time, the system appeared to be operating normally. Alarm records show no activity from 5:09 p.m. to 5:21 p.m. The crew working in Milpitas was getting ready to wrap up, believing they had successfully completed the planned activities for the day.

71. At 5:22 p.m., the SCADA center alarm console displayed over 60 alarms within a few seconds, including controller error alarms and high differential pressure and backflow alarms from the Milpitas Terminal. These alarms were followed by pressure alarms on several lines leaving the Milpitas Terminal, including Line 132.

72. At 5:23 p.m., records of SCADA alarms and pressure readings indicate valves opening and pressure increasing. The pressure readings measured at flow meters M31, M32 and M38 on Lines 132, 101 and 109, respectively, increased from 370 psig to 380 psig in about 90 seconds.

73. The alarms were likely caused by an intermittent short circuit on a piece of wire in the pressure feedback circuit in the Control System equipment enclosure which contains hundreds of wires. The short circuit started a cascade of failures in the gas pressure sensors and pressure controls which lasted for over three hours. The Contract Engineer and Construction Lead began disconnecting and reconnecting circuits to find where the shorted wires loaded on the 24-volt current loops. At about 8:40 p.m., they eliminated the short and all the instruments and controls then resumed normal operation. The shorted

connection was at a terminal block near the PS-A and PS-B where wires were possibly jostled during connection of the mini-UPS.

74. Because of the malfunctions, PG&E's Gas Operators in San Francisco lost the ability to monitor and control valves at the Milpitas Terminal with the SCADA system displaying inaccurate information.

75. Loss of information and control over the pipelines caused various regulating valves to fully open. This caused gas pressure in lines leaving the Milpitas Terminal, including Lines 101, 109 and 132, to increase. According to data obtained during the investigation, the pressure on Line 132 leaving the Milpitas Terminal reached a high of 396 psig as measured manually.

76. The Gas Technician at Milpitas began to manually apply valve pressure gauges to verify and report pressure readings and positions of regulating and monitoring valves to Gas Operators at the Gas Control Center. The Gas Technician was instructed to manually close certain valves and lower monitor valve set points. About 40 minutes after pressures began rising in the gas discharge header at the Milpitas Terminal, Line 132 ruptured.

77. SCADA data indicated that a rupture had occurred when pressures on Line 132 upstream of the Martin station rapidly decreased from a high of 386 psig.

78. The highest pressure recorded at an upstream location closest to Segment 180 just prior to the failure was determined to be 386 psig.

79. At 6:12 p.m. on September 9, 2010, SCADA showed the upstream pressure at the Martin Station on Line 132 had decreased from 361.4 psig to 289.9 psig. At 6:15 p.m., SCADA showed a low-low alarm at the Martin Station that indicated a pressure of 144 psig on Line 132. Pursuant to PG&E's procedure, members of

Gas Control attempted to troubleshoot the alarms by examining the pressures and conditions at different stations.

80. At 6:12 p.m. the first police unit arrived at the scene. By 6:17 p.m., the first San Bruno Fire Department unit arrived at the scene.

81. No outgoing calls were made by PG&E to fire or police officials upon discovery of the incident.

82. At 6:18 p.m., an off-duty PG&E employee notified the PG&E Dispatch center in Concord, California, of an explosion in the San Bruno area. Over the next few minutes, the dispatch center received additional similar reports.

83. At 6:18 p.m., PG&E Dispatch was notified of a fire in San Bruno by an off-duty PG&E employee who speculated a jet crash. The dispatcher responded that a supervisor would be notified.

84. At 6:21 p.m., an off-duty a Gas Service Representative (GSR) called into Dispatch alerting them that there was a fire in San Bruno that appeared to be gas fed. The dispatcher responded that he would send a GSR out to investigate.

85. At 6:23 p.m., PG&E Dispatch sent a GSR working in Daly City (about eight miles from San Bruno) to confirm the report. About the same time, PG&E's Senior Distribution Specialist, who saw the fire while driving home from work, reported the fire to the PG&E Dispatch center and proceeded to the scene.

86. At 6:25 p.m., PG&E's Dispatch called the Peninsula On-Call Supervisor to advise him of the incident. He responded, "I'm probably on my way."

87. At 6:27 p.m., while Gas Operators 1 and 2 were still in the process of determining the cause of the alarm, PG&E Dispatch called Gas Operator 3 to inquire if they noticed a loss of pressure in San Bruno. PG&E Dispatch advised about large flames and that a GSR and a Supervisor were heading to the scene. Gas Operator 3 responded that they had not received any calls yet.

88. At 6:28 p.m., the PG&E Gas Controllers discussed the low-low pressure alarms amongst themselves and associated the reports of the fire at San Bruno with the pressure drop at Martin Station. At 6:29 p.m., a PG&E Gas Controller mentioned to a caller that pressure on Line132 had dropped from 396 psig to 56 psig and that "we have a line break in San Bruno… while we have Milpitas going down."

89. At 6:30 p.m., PG&E Dispatch called the GSR to check on his status. The GSR was still in traffic at the time. The M&C Superintendent of the Bay Area, on-call 24/7 to respond to any gas event within his area, arrived at the scene just after 6:30 p.m., as the result of seeing news of the explosion and fire on television.

90. At 6:31 p.m., Gas Operator 1 called PG&E Dispatch regarding the previous inquiry about the loss of pressure and speculated that PG&E's gas facilities may be involved in the incident. PG&E Dispatch responded to Gas Control that a radio news report claimed the fire was due to a gasoline station explosion.

91. At 6:32 p.m., Gas Control left a message for San Francisco Transmission and Regulation Supervisor about the low-low alarm at Martin Station, and the possibility of a leak.

92. At 6:35 p.m., the M&C Superintendent of the Bay Area called Gas Control to inquire about the fire and told them to call the superintendent of the region. He then proceeded to the scene. At about the same time, Mechanic 1 called Dispatch, saying that PG&E's transmission line ran through the scene of the fire and that the flame was consistent with ignited gas from a transmission line. As Mechanic 1 headed to the Colma yard (Yard), he was called by Mechanic 2, who was then told to head to the Yard.

93. At 6:36 p.m., the San Francisco T&R Supervisor returned the Gas Control's call and told them to contact the Peninsula Division T&R Supervisor. The gas

controllers had been coordinating with the Sr. Gas Coordinator to make the appropriate contacts.

94. At 6:40 p.m., after confirming the involvement of PG&E's facilities with Dispatch and Gas Control, the Peninsula On-Call Supervisor called M&C Mechanics 1 and 2 and told them to "get to the yard, get their vehicles and head in that direction (of the valves)."

95. Some PG&E first responders at the scene of the incident could not identify the cause of the fire. PG&E had not offered specific training for its first responders on how to recognize the differences between fires of low-pressure natural gas, high pressure natural gas, gasoline fuel, or jet fuel.

96. At 6:41 p.m., the GSR and the Senior Distribution Specialist were at the scene and reported to PG&E Dispatch that the fire department did not yet know the cause of the flames. The GSR made PG&E Dispatch aware that there were gas transmission lines in the area. PG&E Dispatch conveyed to the GSR that a jet might have struck a gasoline station, which in turn caused the gas line to blow with it. The GSR called the Gas Service On-Call Supervisor, and the Gas Service Night Supervisor, to let them know he was on site. The Gas Service Night Supervisor arrived on site later.

97. At 6:48 p.m., the Senior Distribution Specialist told PG&E Dispatch, "We've got a plane crash" and "we need a couple of gas crews and electric crews." Dispatch acknowledged the request.

98. Mechanic 1 arrived at the Yard at 6:50 p.m. Mechanic 2 arrived soon after. More internal contacts ensued. At 6:51 p.m., a Gas Control Operator claimed, "it looks like it might [be transmission], if anything, distribution."

99. At 6:53 p.m., the San Francisco Division T&R Supervisor communicated to Gas Control that he had crews responding, but they might be heading to Martin

Station. At 6:54 p.m., San Bruno Police called PG&E Dispatch requesting gas support. PG&E Dispatch replied, "We know, they're out there already." PG&E Dispatch then told the Troublemen Supervisor about a plane that had crashed into a gas station, and asked for gas and electric utilities in the area to be turned off. The Troublemen Supervisor replied that he was notifying the troublemen.

100. At 6:57 p.m., PG&E's Operations Emergency Center (OEC) was opened. While watching the news on a television at the Yard, Mechanic 1 identified the location of the incident and the nearest valves to be shut to cut off fuel to the fire.

101. At 7:02 p.m., the San Mateo County Sheriff asked PG&E Dispatch if they were aware of the plane crash; PG&E Dispatch responded, "I'll go ahead and relay that message." At around the same time, Mechanic 1 called Dispatch and notified them of his plan to shut valves to isolate the rupture.

102. At 7:06 p.m., Mechanic 1 called the Peninsula Division T&R Supervisor for authorization to shut the valves. The Peninsula Division T&R Supervisor approved. Mechanics 1 and 2 proceeded to the first valve location (containing valve V-38.49). Gas Control was continuously making and receiving calls to gather and relay information.

103. At around 7:07 p.m., a Gas Control Operator mentioned that the M&C Superintendent of the Bay Area was on site but could not get close enough to the actual location itself because of the extent of the fire and that "until the crew arrives, secures it and comes up with a plan, we're just going to continue to feed it."

104. At 7:12 p.m., the electrical operations Troublemen Supervisor told PG&E Dispatch about his plan to order a mandatory call out requiring all Colma Yard employees to report in.

105. At 7:15 p.m., a Gas Control operator commented, "The fire is so big I guess they can't determine anything right now." At approximately 7:15 p.m., a Federal Aviation Administration representative informed PG&E's M&C Superintendent of the Bay Area that there was no plane involved in the incident.

106. At 7:16 p.m, PG&E Dispatch began to relay the electrical operations Troublemen Supervisor's plan. Minutes later, the M&C Superintendent of the Bay Area instructed the Senior Distribution Specialist, who was with him at the time, to call Gas Control and tell them the fire was gas related and to declare it a reportable incident. Mechanics 1 and 2 arrived at the first valve location at 7:20 p.m. At 7:22 p.m., the Senior Distribution Specialist contacted PG&E Dispatch and said that while unconfirmed, it looked like gas was involved. At 7:22 p.m., Gas Control told the Senior Vice President that the incident was likely to be a Line 132 break, although nothing had been confirmed. At 7:25 p.m., PG&E Dispatch informed Gas Control that the M&C Superintendent of the Bay Area was on scene and confirmed that the incident was a reportable gas fire. Gas Control confirmed that Line 132 was the involved line. At 7:27 p.m., the San Francisco Division T&R Supervisor requested that Gas Control lower the pressure set points as low as possible at the Martin Station to isolate Line 132 from the north.

107. At 7:29 p.m., Gas Control remotely closed the involved Line132 valves at Martin Station to cut off the feed of gas north of the rupture. By 7:46 p.m., Mechanics 1 and 2 had traveled north of the rupture and closed valves V-40.05 and V-40.05-2 at Healy Station to isolate the rupture.

108. PG&E took 95 minutes to isolate the location of the rupture. The time for isolation could have been reduced had PG&E installed remote control valves, automatic shut-off valves), and/or appropriately spaced pressure and flow

transmitters throughout its system to allow them to quickly identify and isolate line breaks.

109. By early morning on September 10, firefighters declared 75% of all active fires to be contained. By the end of the day on September 11, 2010, fire operations continued to extinguish fires and monitor the incident area for hot spots and then transferred incident command to the San Bruno Police Department.

110. During the 50 hours following the incident, about 600 firefighting (including emergency medical service) personnel and 325 law enforcement personnel responded. Fire crews and police officers conducted evacuations and door-to-door searches of houses throughout the response. In total, about 300 homes were evacuated. Firefighting efforts included air and forestry operations. Firefighters, police officers, and members of mutual aid organizations also formed logistics, planning, communications, finance, and damage assessment groups to orchestrate response efforts and assess residential damage in the area.

111. PG&E performed post-incident drug testing of three PG&E employees and a PG&E contractor working on the UPS Clearance at the Milpitas Terminal. The drug testing was administered by a third party independent laboratory on September 10, 2011 between 3:36 a.m. and 5:21 a.m., and all four individuals tested negative. The post incident alcohol test of the same four individuals was performed on September 10, 2011 between 3:10 a.m. and 5:02 a.m.

112. PG&E did not perform any drug or alcohol testing of its SCADA staff.

113. PG&E cannot identify any PG&E requests for the recovery of costs for safety improvements to the natural gas transmission pipeline system that were denied by the Commission.

114. Between 1999 and 2010, PG&E's GT&S revenues were at least $435 million higher than the amounts needed to earn the authorized return on equity (ROE).

115. PG&E's actual GT&S ROE averaged 14.3% during 1999 to 2010 and its authorized ROE averaged 11.2% over that period.

116. In 2009 and 2010, only 13% of the total miles assessed by PG&E had been inspected using ILI tools. At the same time, approximately 80% of Southern California Gas Company's transmission pipeline located in high-consequence areas has been inspected using ILI tools.

117. PG&E changed assessment methods for some projects from in-line inspections to ECDA to reduce costs.

118. PG&E deferred some integrity management expense projects to future years.

119. PG&E changed the definition of the pipelines covered by integrity management rules in 2010 to reduce the scope of the integrity management program.

120. PG&E's 2009 Investor Conference presentation included a slide on "Expenditures," which showed decreasing investments in gas transmission infrastructure; from $250 million in 2009 to $200 million in 2010.

121. On February 16, 2005, the Chairman of the Board, Chief Executive Officer and President presented the idea of "Transformation" to the boards of directors, a company-wide business and cultural transformation campaign to reduce operating costs and instill a change in its corporate culture. As stated in the 2006 Annual Report, the reason for the investment in Transformation was, "If the actual cost savings are greater than anticipated, such benefits would accrue to shareholders."

122. PG&E Company's 2009 Annual Report discloses that the utility accrued $38 million, after-tax, of severance costs related to the elimination of approximately 2% of its workforce. PG&E stated the 2% workforce reduction equated to about 409 employees.

123. PG&E Company authorized a cash dividend in 2005 of $476 million; in 2006, $494 million; in 2007, $547 million; in 2008, $589 million; and, in 2009, $624 million.

124. PG&E's 2010 Annual Report stated that during each of 2008, 2009, and 2010, the utility paid $14 million of dividends on preferred stock. On December 15, 2010, the board declared a cash dividend on its outstanding series of preferred stock totaling $4 million that was paid on February 15, 2011.

125. On December 15, 2004, PG&E's board authorized a purchase of shares of the company's issued and outstanding common stock with an aggregate purchase price not to exceed $1.8 billion, not later than December 31, 2006. By June 15, 2005, the Company projected that it may be able to repurchase additional shares of common stock through the end of 2006 in an aggregate amount of $500 million and, as such, increased the amount of the common stock repurchase authorization for a total authorization of $2.3 billion.

126. The 2010 Annual Report notes that $57 million was provided in each year of 2008 and 2009, and $56 million was provided in 2010 as bonus compensation to PG&E Corporation employees and non-employee directors. PG&E provides a Short-term Incentive Plan, a "Pay-for-Performance" bonus, and a Reward and Recognition Program.

Conclusions of Law

1. Although this proceeding is an investigation into alleged violations connected with the San Bruno explosion and fire, it is not focused or dependent

upon determining the root cause of the disaster; it is focused on determining whether PG&E violated gas transmission safety laws and determining appropriate fines and remedies for violations that are found to have occurred.

2. Section 451 without qualification requires all public utilities to provide and maintain "adequate, efficient, just, and reasonable" service and facilities as are necessary for the "safety, health, comfort, and convenience" of their customers and the public.

3. There is no redundancy in the co-existence of the general, overarching safety obligation established by Section 451 and specific safety requirements such as those set forth in GO 112 and Title 49 of the CFR.

4. Failure of a utility to follow or comply with industry safety standards can be an unsafe practice and result in a violation of Section 451.

5. Because CPSD's alleged Section 451 violations are grounded in the opinions of qualified experts and/or industry safety standards such as the ASME and API standards, those allegations are not based on arbitrary or "free-floating" standards.

6. PG&E's arguments for application of the clear and convincing standard of proof in this proceeding should be rejected.

7. CPSD is not required to prove that PG&E had knowledge of unsafe conditions, operations, or practices because public welfare offenses are strict liability offenses and mental state is not a defense; therefore, the sole inquiry is whether a violation occurred, not whether PG&E knew it was violating the law when it did so.

8. PG&E's claim that Section X of the CPSD Report is and can be the sole basis for consideration of alleged violations in this proceeding should be rejected.

9. CPSD's provision of greater specificity in the statement of alleged violations in its opening brief did not represent a misleading change of legal theory of the charges against PG&E; PG&E received adequate notice of the charges against it prior to the hearing.

10. It is within our discretion to invite and permit intervenors to fully participate in our enforcement proceedings, including participation by alleging violations.

11. For a continuing violation to occur under Section 2108, it is the violation itself that must be ongoing, not its result.

12. PG&E has an ongoing obligation to operate its transmission pipeline system in a safe manner, and to conclude that this enforcement action is barred by laches would undermine that public safety mandate.

13. The Commission may consider evidence of post-incident remedial measures undertaken by PG&E for purposes including impeachment and rebuttal to contentions that safety regulations do not require it undertake measures that parties contend are required by law.

14. While it is not necessary to ignore or disregard the testimony of witnesses who presented contradictory testimony, did not have personal knowledge of the subject matter, did not consider relevant evidence, or whose testimony had other infirmities, it may be appropriate to accord reduced weight to the testimony of such witnesses.

15. PG&E violated Section 841.412(c) of ASME B31.1.8-1955 by not conducting a hydrostatic test on Segment 180 post-installation, creating an unsafe system in violation of Section 451. This violation began in 1956 and, because PG&E did not subsequently conduct a hydrostatic test, continued to September 9, 2010.

16. By failing to visually inspect for and discover the defects in Segment 180, PG&E violated Section 811.27(A) of ASME B31.1.8-1955, creating an unsafe system in violation of Section 451. This violation occurred in 1956.

17. By installing pipe sections in Segment 180 that were less than five feet in length, PG&E violated API 5LX Section VI, creating an unsafe system in violation of Section 451. This violation occurred in 1956.

18. By assigning a yield strength value for Segment 180 above 24,000 psi when the yield strength was actually unknown, PG&E violated Section 811.27(G) of ASME B31.1.8-1955, creating an unsafe system in violation of Section 451. This violation occurred in 1956.

19. By not completely welding the inside of the longitudinal seams on pups 1, 2, and 3 of Segment 180 and failing to measure the wall thickness to ensure compliance with the procurement orders which required 0.375-inch wall thickness, PG&E violated Section 811.27(C) of ASME B31.1.8-1955, creating an unsafe system in violation of Section 451. This violation occurred in 1956.

20. By welding the pups in a deficient manner such that the girth welds contained incomplete fusion, burnthrough, slag inclusions, cracks, undercuts, excess reinforcement, porosity defects, and lack of penetration, PG&E violated Section 1.7 of API standard 1104 (4th edition, 1956), creating an unsafe system in violation of Section 451. This violation occurred in 1956.

21. By failing to properly account for the actual conditions, characteristics, and specifications of the Segment 180 pups when it established the MAOP of 400 psig for Segment 180, PG&E failed to comply with the MAOP determination requirements in Section 845.22 of ASME B31.1.8-1955. PG&E therefore created an unsafe system condition in violation of Section 451. This violation occurred in 1956.

22. By installing pipeline sections in Segment 180 out of compliance with industry standards and transmission pipe specifications, and not suitable or safe for the conditions under which they were used, contrary to Section 810.1 of ASME B31.1.8-1955, PG&E created an unreasonably unsafe system in violation of Section 451. Because the unsafe condition remained uncorrected, this violation continued from 1956 to September 9, 2010.

23. There is no basis to find violations of 49 CFR Part 192 Subpart O occurring prior to February 14, 2004, and it is not reasonable to find Subpart O violatonis occurring prior to December 17, 2004.

24. An integrity management audit that fails to find a safety violation does not absolve PG&E of responsibility and accountability for that violation.

25. An operator may not be excused from complying with integrity management rules provided that it is following a consensus industry practice.

26. PG&E violated ASME-B31.8S Appendix A, Section 4.2, and 49 CFR 192.917(b), by failing to use conservative assumptions where PG&E was missing important pipeline data such as pipe material, manufacturing process, and seam type. This violation continued from December 17, 2004 to September 9, 2010.

27. PG&E violated 49 CFR 192.917(b), by not adequately gathering and integrating required pipeline data, thereby not having an adequate understanding of the threats on Line 132. This violation continued from December 17, 2004 to September 9, 2010.

28. PG&E's failure to analyze the data on pipeline weld defects resulted in an incomplete understanding of the manufacturing threats to Line 132, in violation of 49 CFR 192.917(a) and ASME-B31.8S Section 2.2. This violation continued from December 17, 2004 to September 9, 2010.

29. PG&E violated 49 CFR 192.917(e)(2), by failing to consider and test for the threat of cyclic fatigue on Segment 180. This violation continued from December 17, 2004 to September 9, 2010.

30. As a result of ignoring the category of DSAW as one of the weld types potentially subject to manufacturing defects, PG&E failed to determine the risk of failure from this defect in violation of 49 CFR 192.917(e)(3). This violation continued from December 17, 2004 to September 9, 2010.

31. PG&E violated 49 CFR 192.917(e)(3) by not considering manufacturing and construction defects on Line 132 unstable and prioritizing the covered segments as high risk for the baseline assessment or a subsequent reassessment, and thereby failing to determine the risk of failure from manufacturing and construction defects of Line 132 after operating pressure increased above the maximum operating pressure experienced during the preceding five years. This violation continued from December 17, 2004 to September 9, 2010.

32. By not performing pipeline inspections using a method capable of detecting seam issues, PG&E violated 49 CFR 192.921(a). This violation continued from December 17, 2004 to September 9, 2010.

33. PG&E violated 49 CFR 192.917(c) and ASME-B31.8S Section 5, by using risk ranking algorithms that did not: (1) properly weigh the threats to Line 132, because PG&E did not include its actual operating experience; (2) properly identify the Potential Impact Radius of a rupture, by using a value of 300 feet where the PIR is less than that; (3) identify the proper Consequence of Failure formula, by not accounting for higher population densities; (4) use conservative values for electrical interference on Line 132, which created an external corrosion threat; (5) include any consideration of one –call tickets, which indicates third party damage threats; (6) include any consideration of historic problems with the

type of pipe used on Segment 180. This violation continued from December 17, 2004 to September 9, 2010.

34. PG&E violated Public Utilities Code section 451 by engaging in the practice of increasing the pressure on Line 132 every five years to set the MAOP for the purpose of eliminating the need to deem manufacturing and construction threats unstable, thereby avoiding the need to conduct hydrostatic testing or in-line inspections on Line 132. This violation continued from December 17, 2004 to September 9, 2010.

35. PG&E violated 49 CFR 192.13(c), by failing to follow its internal work procedures that are required to be established under 49 CFR 192. This violation occurred on September 9, 2010.

36. By failing to follow its work procedures on September 9, 2010, PG&E created an unreasonably dangerous condition in violation of Section 451. This violation occurred on September 9, 2010.

37. PG&E violated 49 CFR 192.605(c), by failing to establish adequate written procedures for maintenance and operations activities under abnormal conditions. This violation occurred on September 9, 2010.

38. PG&E created an unreasonably unsafe system in violation of Public Utilities Code Section 451, by poorly maintaining a system at Milpitas that had defective electrical connections, improperly labeled circuits, missing wire identification labels, aging and obsolete equipment, and inaccurate documentation. This violation continued from February 28, 2010 to September 9, 2010.

39. PG&E's slow and uncoordinated response to the explosion violates the requirement of 49 CFR 192.615(a)(3) for an operator to respond promptly and effectively to an emergency. This violation occurred on September 9, 2010.

40. PG&E did not adequately receive, identify, and classify notices of the emergency, in violation of 49 CFR 192.615(a)(1). This violation occurred on September 9, 2010.

41. PG&E did not provide for the proper personnel, equipment, tools and materials at the scene of an emergency, in violation of 49 CFR 192.615(a)(4). This violation occurred on September 9, 2010.

42. PG&E's efforts to perform an emergency shutdown of its pipeline were inadequate to minimize hazards to life or property, in violation of 49 CFR 192.615(a)(6). This violation occurred on September 9, 2010.

43. Rather than make safe any actual or potential hazards to life or property, PG&E's response made the hazards worse, in violation of 49 CFR 192.615(a)(7). This violation occurred on September 9, 2010.

44. PG&E's failure to notify the appropriate first responders of an emergency and coordinate with them violated 49 CFR 192.615(a)(8). It is clear that PG&E's emergency plans were ineffective, and were not followed. This violation occurred on September 9, 2010.

45. PG&E violated 49 CFR 192.605(c)(1) and (3) by failing to have an emergency manual that properly directed its employees to respond to and correct the cause of Line 132's decrease in pressure, and its malfunction which resulted in hazards to persons and property, and notify the responsible personnel when notice of an abnormal operation is received. This violation occurred on September 9, 2010.

46. PG&E failed to establish and maintain adequate means of communication with the appropriate fire, police and other public officials, in violation of 49 CFR 192.615(a)(2). This violation occurred on September 9, 2010.

47. PG&E violated 49 CFR 199.225(a), by failing to perform alcohol tests on the employees involved within 2 hours of the incident, and failing to record the reasons for not administering the test in a timely fashion. This violation occurred on September 9, 2010.

48. PG&E's failure to create and follow good emergency plans created an unreasonably unsafe system in violation of Public Utilities Code Section 451. This violation occurred on September 9, 2010.

49. PG&E created an unreasonably unsafe system in violation of Public Utilities Code Section 451, by continuously cutting its safety-related budgets for its GT&S. This violation continued from January 1, 2008 to September 9, 2010.

O R D E R

IT IS ORDERED that:

1. The Commission finds and concludes that Pacific Gas and Electric Company committed violations of the Public Utilities Code and Title 49 of the Code of Federal Regulations as set forth in the foregoing Findings of Fact and Conclusions of Law and in Appendix B to this decision. The Findings of Fact, Conclusions of Law, and Appendix B shall be considered by the Commission, in a separate decision, in determining appropriate fines and/or other remedies for such violations.

2. Investigation 12-01-007 remains open.

This order is effective today.

Dated _____, at San Francisco, California.

Appendix A

List of Parties

********** PARTIES **********

Traci Bone
Legal Division
RM. 5027
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-2048
tbo@cpuc.ca.gov
For: ORA

Britt K. Strottman
MEYERS NAVE
555 12TH STREET, STE. 1500
OAKLAND CA 94607
(510) 808-2083
bstrottman@meyersnave.com
For: City of San Bruno

Harvey Y. Morris SED
Legal Division
505 Van Ness Avenue, RM. 5036
San Francisco CA 94102 3298
(415) 703-1086
hym@cpuc.ca.gov
For: SED

Theresa L. Mueller, Chief Energy & Telecom. Deputy
OFFICE OF THE CITY ATTY. DENNIS HERRERA
CITY HALL
1 DR. CARLTON B. GOODLETT PL., RM. 234
SAN FRANCISCO CA 94102
(415) 554-4640
theresa.mueller@sfgov.org
For: City and County of San Francisco

Joseph M. Malkin
ORRICK HARRINGTON
EMAIL ONLY CA 00000
(415) 773-5505
jmalkin@orrick.com
For: Pacific Gas & Electric

Thomas J. Long, Legal Dir.
THE UTILITY REFORM NETWORK
785 MARKET ST., STE. 1400
SAN FRANCISCO CA 94103
(415) 929-8876 X303
TLong@turn.org
For: The Utility Reform Network

********** STATE EMPLOYEE **********

Niki Bawa
Executive Division
RM. 5038
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-2049
nb2@cpuc.ca.gov

Kenneth Bruno
Safety and Enforcement Division
AREA 2-D
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-5265
kab@cpuc.ca.gov

David Peck
Ora
CALIFORNIA PUBLIC UTILITIES COMMISSION
EMAIL ONLY
EMAIL ONLY CA 00000
(415) 703-1213
DBP@cpuc.ca.gov

Karen Paull
Interim Chief Counsel
CALIFORNIA PUBLIC UTILITIES COMMISSION
EMAIL ONLY
EMAIL ONLY CA 00000
(415) 703-2630
kpp@cpuc.ca.gov

Christine Hammond
CPUC - LEGAL
EMAIL ONLY CA 00000
(415) 703-1461
cjh@cpuc.ca.gov

Michael Minkus
Legislative Liaison
CPUC - OFFICE OF GOV'T AFFAIRS
EMAIL ONLY CA 00000
(916) 905-7364
michael.minkus@cpuc.ca.gov

Christopher Chow
Executive Division
505 Van Ness Avenue, RM. 5301
San Francisco CA 94102 3298
(415) 703-2234
crs@cpuc.ca.gov

Michelle Cooke
Administrative Services
RM. 2004
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-2163
mlc@cpuc.ca.gov

Elizabeth Dorman
Legal Division
RM. 4300
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-1415
edd@cpuc.ca.gov

Maryam Ebke
Administrative Law Judge Division
RM. 5112
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-2271
meb@cpuc.ca.gov

Julie A. Fitch
Executive Division
RM. 5214
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-3134
jf2@cpuc.ca.gov

Julie Halligan
Administrative Law Judge Division
RM. 5041
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-1587
jmh@cpuc.ca.gov

Andrew Kotch
Executive Division
RM. 5301
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-1072
ako@cpuc.ca.gov

Kelly C. Lee
Office of Ratepayer Advocates
505 Van Ness Avenue, RM. 4108
San Francisco CA 94102 3298
(415) 703-1795
kcl@cpuc.ca.gov

Richard A. Myers
Energy Division
AREA 4-A
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-1228
ram@cpuc.ca.gov

Tony Marino
OFFICE OF SENATOR JERRY HILL
EMAIL ONLY
EMAIL ONLY CA 00000
(916) 651-4013
tony.marino@sen.ca.gov

Marion Peleo
Legal Division
RM. 4107
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-2130
map@cpuc.ca.gov

Terrie D. Prosper
Executive Division
RM. 5301
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-2160
tdp@cpuc.ca.gov

Jonathan J. Reiger
Legal Division
RM. 5035
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 355-5596
jzr@cpuc.ca.gov

Raffy Stepanian
Safety and Enforcement Division
RM. 500
320 West 4th Street Suite 500
Los Angeles CA 90013
(213) 576-5772
rst@cpuc.ca.gov

Mark S. Wetzell
Administrative Law Judge Division
RM. 5003
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-1491
msw@cpuc.ca.gov

********** **INFORMATION ONLY** **********

David Marcus
ADAMS BROADWELL & JOSEPH
EMAIL ONLY
EMAIL ONLY CA 00000-0000
(510) 528-0728
dmarcus2@sbcglobal.net

Marc D. Joseph
Attorney At Law
ADAMS BROADWELL JOSEPH & CARDOZO
601 GATEWAY BLVD. STE 1000
SOUTH SAN FRANCISCO CA 94080
(650) 589-1660
mdjoseph@adamsbroadwell.com

Rachael Koss
ADAMS BROADWELL JOSEPH & CORDOZO
601 GATEWAY BLVD., STE. 1000
SOUTH SAN FRANCISCO CA 94080
(650) 589-1660
rkoss@adamsbroadwell.com

Randall Li
Analyst
AEGEAN OIL USA, LLC
20 SIGNAL RD
STAMFORD CT 06902-7909
(664) 722-2007
randall@nexusamllc.com

Michael J. Aguirre, Esq.
MARIA C. SEVERSON
Attorney
AGUIRRE MORRIS & SEVERSON LLP
444 WEST C STREET, SUITE 210
SAN DIEGO CA 92101
(619) 876-5364
maguirre@amslawyers.com
For: Ruth Henricks

John Mcintyre
ALCANTAR & KAHL
33 NEW MONTGOMERY STREET, SUITE 1850
SAN FRANCISCO CA 94105
(415) 421-4143 X-109
jfm@a-klaw.com

Karen Terranova
ALCANTAR & KAHL
33 NEW MONTGOMERY STREET, SUITE 1850
SAN FRANCISCO CA 94105
(415) 403-5542
filings@a-klaw.com

Nora Sheriff
ALCANTAR & KAHL LLP
33 NEW MONTGOMERY ST., STE. 1850
SAN FRANCISCO CA 94105
(415) 421-4143
nes@a-klaw.com

Mike Cade
ALCANTAR & KAHL, LLP
EMAIL ONLY
EMAIL ONLY OR 00000
(503) 402-8711
wmc@a-klaw.com

John Apgar, Cfa
BANK OF AMERICA MERRILL LYNCH RESEARCH
ONE BRYANT PARK, 15TH FL.
NEW YORK NY 10036
(646) 855-3753
John.Apgar@baml.com

K. Konolige
BGC FINANCIAL, LP
EMAIL ONLY
EMAIL ONLY CA 00000
kkonolige@bgcpartners.com

Peter Battaglia
BGC FINANCIAL, LP
EMAIL ONLY
EMAIL ONLY CA 00000
(201) 787-9386
pbattaglia@bcgpartners.com

Mark Chediak
Energy Reporter
BLOOMBERG NEWS
EMAIL ONLY CA 00000
(415) 617-7233
mchediak@bloomberg.net

Andrew Greenberg
CADWALADER WICKERSHAM & TAFT LLP
ONE WORLD FINANCIAL CENTER
NEW YORK NY 10281
(212) 504-6077
andrew.greenberg@cwt.com

Kenneth W. Irvin
CADWALADER WICKERSHAM & TAFT LLP
700 SIXTH STREET, N.W.
WASHINGTON DC 20001
(202) 862-2315
ken.irvin@cwt.com

Terence T. Healey
CADWALADER WICKERSHAM & TAFT LLP
700 ISXTH ST., N.W.
WASHINGTON DC 20001
(202) 862-2335
terence.healey@cwt.com

Deborah Slon
Deputy Attorney General
CALIFORNIA DEPARTMENT OF JUSTICE
1515 CLAY STREET, STE. 2000
OAKLAND CA 94612
(510) 622-2112
deborah.slon@doj.ca.gov

CALIFORNIA ENERGY MARKETS
425 DIVISADERO ST. STE 303
SAN FRANCISCO CA 94117-2242
(415) 963-4439
cem@newsdata.com

Jack D'Angelo
CATAPULT CAPITAL MANAGEMENT LLC
666 5TH AVENUE, 9TH FLOOR
NEW YORK NY 10019
(212) 320-1059
jdangelo@catapult-llc.com

Melissa Kasnitz
Attorney
CENTER FOR ACCESSIBLE TECHNOLOGY
3075 ADELINE STREET, STE. 220
BERKELEY CA 94703
(510) 841-3224 X2019
service@cforat.org

Sophie Karp
CITIGROUP
388 GREENWICH ST.
NEW YORK NY 10013
(212) 816-3366
sophie.karp@citi.com

Austin M. Yang
Deputy City Attorney
CITY AND COUNTY OF SAN FRANCISCO
OFFICE OF THE CITY ATTORNEY, RM. 234
1 DR. CARLTON B. GODDLETT PLACE
SAN FRANCISCO CA 94102-4682
(415) 554-6761
austin.yang@sfgov.org

Keith Helmuth. P.E.
CITY OF MADERA
205 W. FOURTH STREET
MADERA CA 93637
(559) 661-5418
khelmuth@cityofmadera.com

Jessica Mullan
Senior Deputy City Attorney
CITY OF PALO ALTO
PO BOX 10250
PALO ALTO CA 94303
(650) 329-2577
jessica.mullan@cityofpaloalto.org

Connie Jackson
City Manager
CITY OF SAN BRUNO
567 EL CAMINO REAL
SAN BRUNO CA 94066-4299
(650) 616-7056
cjackson@ci.sanbruno.ca.us

Jim Von Riesemann
Managing Director
CRT CAPITAL GROUP LLC
EMAIL ONLY
EMAIL ONLY CT 00000
(203) 569-4336
jvonriesemann@crtllc.com

Sarah Grossman-Swenson
DAVIS COWELL & BOWE, LLP
595 MARKET STREET, STE. 1400
SAN FRANCISCO CA 94105
(415) 497-7200
sgs@dcbsf.com

Ann Trowbridge
Attorney
DAY CARTER & MURPHY LLP
3620 AMERICAN RIVER DR., STE. 205
SACRAMENTO CA 95864
(916) 570-2500 X103
ATrowbridge@DayCarterMurphy.com

Jonathan Arnold
DEUTSCHE BANK
60 WALL STREET
NEW YORK NY 10005
(212) 250-3182
jonathan.arnold@db.com

Lauren Duke
DEUTSCHE BANK SECURITIES INC.
EMAIL ONLY
EMAIL ONLY NY 00000
(212) 250-8204
lauren.duke@db.com

Adam Miller
DRW
540 W. MADISON , STE. 2600
CHICAGO IL 60661
(312) 542-3478
filings@drw.com

Andrew B. Brown
ELLISON, SCHNEIDER & HARRIS LLP
2600 CAPITOL AVENUE, SUITE 400
SACRAMENTO CA 95816-5905
(916) 447-2166
abb@eslawfirm.com

Travis Foss
Legal Division
RM. 5026
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-1998
ttf@cpuc.ca.gov
For: SED (formerly CPSD)

Paul Patterson
GLENROCK ASSOCIATES LLC
EMAIL ONLY
EMAIL ONLY NY 00000
(212) 246-3318
ppatterson2@nyc.rr.com

Brian T. Cragg
Attorney
GOODIN, MACBRIDE, SQUERI, DAY & LAMPREY
505 SANSOME STREET, SUITE 900
SAN FRANCISCO CA 94111
(415) 392-7900
BCragg@GoodinMacbride.com

Megan Somogyi
Attorney
GOODIN, MACBRIDE, SQUERI, DAY & LAMPREY
505 SANSOME ST., STE. 900
SAN FRANCISCO CA 94111
(415) 392-7900
MSomogyi@GoodinMacBride.com

Darryl J. Gruen
Legal Division
RM. 5133
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-1973
djg@cpuc.ca.gov

Norman A. Pedersen, Esq.
Attorney At Law
HANNA AND MORTON, LLP
444 SOUTH FLOWER STREET, STE. 1500
LOS ANGELES CA 90071-2916
(213) 430-2510
npedersen@hanmor.com

Charlyn A. Hook
Legal Division
RM. 5131
505 Van Ness Avenue
San Francisco CA 94102 3298
(415) 703-3050
chh@cpuc.ca.gov

Christopher Turnure
J.P. MORGAN CHASE SECURITIES
383 MADISON AVENUE, FLOOR 34
NEW YORK NY 10179
(212) 622-5696
Christopher.Turnure@JPMorgan.com

Anthony Crowdell
Equity Research - Electric Utilities
JEFFERIES LLC
520 MADISON AVENUE, 13TH FL.
NEW YORK NY 10022
(212) 284-2563
acrowdell@jefferies.com

Eric Selmon
JEMZAR CORP.
EMAIL ONLY
EMAIL ONLY IS 000 000
ISRAEL
(646) 843-7200
ESelmon@Jemzar.com

Nazia Sheikh
JP MORGAN CHASE
383 MADISON AVENUE, FLOOR 34
NEW YORK NY 10179
(212) 622-5696
nazia.x.sheikh@jmorgan.com

C. Susie Berlin
LAW OFFICES OF SUSIE BERLIN
1346 THE ALAMEDA, STE. 7, NO. 141
SAN JOSE CA 95126
(408) 778-8478
berlin@susieberlinlaw.com
For: Northern California Generation Coalition (NCGC)

Brendan Naeve
LEVIN CAPITAL STRATEGIES
595 MADISON AVENUE, 17TH FLR
NEW YORK NY 10022
(212) 259-0841
bnaeve@levincap.com

Neil Stein
LEVIN CAPITAL STRATEGIES
595 MADISON AVENUE
NEW YORK NY 10022
(212) 259-0823
NStein@LevinCap.com

Michael Goldenberg
LUMINUS MANAGEMENT
1700 BROADWAY, 38TH FLOOR
NEW YORK NY 10019
(212) 615-3427
mgoldenberg@luminusmgmt.com

Sunny Kwak
MACQUARIE CAPITAL (USA)
125 WEST 55TH STREET
NEW YORK NY 10019
(212) 231-1683
sunny.kwak@macquarie.com

Emilie E. De La Motte
Attorney At Law
MEYERS NAVE
555 12TH STREET, STE. 1500
OAKLAND CA 94607
(510) 808-2000
edelamotte@meyersnave.com

Susan Griffin
Paralegal
MEYERS NAVE
555 12TH STREET, STE. 1500
OAKLAND CA 94607
(510) 808-2000
sgriffin@meyersnave.com

Steven R. Meyers
Principal
MEYERS, NAVE, RIBACK, SILVER & WILSON
555 12TH STREET, STE. 1500
OAKLAND CA 94607
(510) 808-2000
smeyers@meyersnave.com

Gregory Reiss
MILLENNIUM MANAGEMENT LLC
666 FIFTH AVENUE, 8TH FLOOR
NEW YORK NY 10103
(212) 320-1036
Gregory.Reiss@mlp.com

Rajeev Lalwani
MORGAN STANLEY
EMAIL ONLY
EMAIL ONLY NY 00000
(212) 761-6978
rajeev.lalwani@morganstanley.com

Stephen Byrd
MORGAN STANLEY
1585 BROADWAY, 38TH FLOOR
NEW YORK NY 10036
(212) 761-6978
stephen.byrd@morganstanley.com

Phillip Moskal
EMAIL ONLY
EMAIL ONLY CA 00000
thnxvm@gmail.com

Tom Bottorff
PACIFIC GAS & ELECRIC COMPANY
77 BEALE STREET, MC B32
SAN FRANCISCO CA 94105
teb3@pge.com

Attn.: Agent For Service Of Process
PACIFIC GAS & ELECTRIC COMPANY
77 BEALE ST., STE. 100
SAN FRANCISCO CA 94105

Bruce Smith
PACIFIC GAS & ELECTRIC COMPANY
EMAIL ONLY
EMAIL ONLY CA 00000
BTS1@pge.com

Dionne Adams
PACIFIC GAS & ELECTRIC COMPANY
2700 YGNACIO VALLEY ROAD, SUITE 100
WALNUT CREEK CA 94598
(925) 459-3757
dng6@pge.com

Shilpa Ramaiya
PACIFIC GAS & ELECTRIC COMPANY
EMAIL ONLY
EMAIL ONLY CA 00000
(415) 973-3486
SRRD@pge.com

Case Administration
PACIFIC GAS AND ELECTRIC COMPANY
77 BEALE ST./ PO BOX 770000; MC B9A
SAN FRANCISCO CA 94177
regrelcpuccases@pge.com

Kevin Hietbrink
Regulatory Case Coordinator
PACIFIC GAS AND ELECTRIC COMPANY
EMAIL ONLY
EMAIL ONLY CA 00000
(415) 973-0223
kxhy@pge.com

Michelle L. Wilson
PACIFIC GAS AND ELECTRIC COMPANY
MAIL CODE B30A
77 BEALE STREET, ROOM 1087
SAN FRANCISCO CA 94105
(415) 973-6655
mlw3@pge.com

Henry W. Pielage, P.E.
Ratepayer Advocate
2860 GLEN CANYON ROAD
SANTA CRUZ CA 95060
henrypielage@comcast.net

Ted Heyn
POINTSTATE CAPITAL
40 WEST 57TH ST., 25TH FLOOR
NEW YORK NY 10019
(212) 830-7061
ted@pointstate.com

William Westfield
SACRAMENTO MUNICIPAL UTILITY DISTRICT
6201 S STREET
SACRAMENTO CA 95817-1899
(916) 732-6123
William.Westfield@smud.org

Hugh Wynne
SANFORD C. BERNSTEIN & CO.
1345 AVENUE OF THE AMERICAS, 15TH FLR
NEW YORK NY 10105
(212) 823-2692
hugh.wynne@bernstein.com

Paul Schaafsma
521 WEST SUPERIOR STREET, UNIT 221
CHICAGO IL 60654
(312) 664-0906
paulschaafsma@yahoo.com

Chris King
SIEMENS SMART GRID SOLUTIONS
4000 E. THIRD AVE., STE. 400
FOSTER CITY CA 94404
(650) 227-7770 X-187
chris_king@siemens.com

Kevin Fallon
SIR CAPITAL MANAGEMENT
620 EIGHTH AVENUE, 22ND FLR.
NEW YORK NY 10018
(212) 993-7104
kfallon@sirfunds.com

Angelica Morales, Attorney
SOUTHERN CALIFORNIA EDISON COMPANY
2244 WALNUT GROVE AVENUE / PO BOX 800
ROSEMEAD CA 91770
(626) 302-6160
angelica.morales@sce.com

Case Administration
SOUTHERN CALIFORNIA EDISON COMPANY
2244 WALNUT GROVE AVENUE, PO BOX 800
ROSEMEAD CA 91770
(626) 302-6906
case.admin@sce.com

Douglas Porter
SOUTHERN CALIFORNIA EDISON COMPANY
2244 WALNUT GROVE AVE./PO BOX 800
ROSEMEAD CA 91770
(626) 302-3964
douglas.porter@sce.com

Frank A. Mcnulty
SOUTHERN CALIFORNIA EDISON COMPANY
2244 WALNUT GROVE AVE. / PO BOX 800
ROSEMEAD CA 91770
(626) 302-1499
Francis.McNulty@sce.com

Gloria Ing
Attorney At Law
SOUTHERN CALIFORNIA EDISON COMPANY
2244 WALNUT GROVE AVE./PO BOX 800
ROSEMEAD CA 91770
(626) 302-1999
gloria.ing@sce.com

Deana Ng
SOUTHERN CALIFORNIA GAS COMPANY
555 W. FIFTH ST., GT14E7
LOS ANGELES CA 90013
dng@semprautilities.com

Jeffrey L. Salazar
SOUTHERN CALIFORNIA GAS COMPANY
555 W. FIFTH STREET, GT14D6
LOS ANGELES CA 90013
jlsalazar@semprautilities.com

Michael Franco
Regulatory Case Mgr
SOUTHERN CALIFORNIA GAS COMPANY
555 WEST FIFTH STREET, GT14D6
LOS ANGELES CA 90013-1011
(213) 244-5839
MFranco@SempraUtilities.com

Rasha Prince
Director, Regulatory Affairs
SOUTHERN CALIFORNIA GAS COMPANY
555 WEST 5TH STREET, GT14D6
LOS ANGELES CA 90013-1034
(213) 244-5141
RPrince@SempraUtilities.com

Sharon Tomkins
SOUTHERN CALIFORNIA GAS COMPANY
555 W. FIFTH ST., GT14E7
LOS ANGELES CA 90013
stomkins@semprautilities.com

Steven Hruby
SOUTHERN CALIFORNIA GAS COMPANY
555 W. FIFTH ST., GT14D6
LOS ANGELES CA 90013
SHruby@SempraUtilities.com

Catherine M. Mazzeo
Associate General Counsel
SOUTHWEST GAS CORPORATION
5241 SPRING MOUNTAIN ROAD
LAS VEGAS NV 89150
(702) 876-7250
catherine.mazzeo@swgas.com
For: Southwest Gas Corporation

Daniel D. Van Hoogstraten
Legal Admin Assistant
STINSON MORRISON HECKER LLP
EMAIL ONLY
EMAIL ONLY DC 00000-0000
(202) 572-9919
dvanhoogstraten@stinson.com

Kelly Daly
STINSON MORRISON HECKER LLP
1775 PENNSYLVANIA AVE., NW, STE. 800
WASHINGTON DC 20006-4605
(202) 728-3011
kdaly@stinson.com
For: Sacramento Municipal Utility District (SMUD)

Matt Fallon
TALON CAPITAL
1001 FARMINGTON AVENUE
WEST HARTFORD CT 06107
(860) 920-1000
mfallon@taloncap.com

Marcel Hawiger, Energy Attorney
THE UTILITY REFORM NETWORK
785 MARKET ST., STE. 1400
SAN FRANCISCO CA 94103
(415) 929-8876 X311
marcel@turn.org

Julien Dumoulin-Smith
UBS INVESTMENT RESEARCH
EMAIL ONLY NY 00000
(212) 713-9848
julien.dumoulin-smith@ubs.com

Ashar Khan, Portfolio Manager
VISIUM ASSET AMANGEMENT
888 SEVENTH AVENUE, 22 FLR.
NEW YROK NY 10019
(212) 474-6880
akhan@visiumfunds.com

Alex Kania
WOLFE RESEARCH
420 LEXINGTON AVENUE, SUITE 648
NEW YORK NY 10170
(646) 582-9244
akania@wolferesearch.com

David Paz
WOLFE RESEARCH
420 LEXINGTON AVE., STE. 648
NEW YORK NY 10170
(646) 582-9242
dpaz@wolferesearch.com

Steve Fleishman
WOLFE RESEARCH
420 LEXINGTON AVENUE, SUITE 648
NEW YORK NY 10170
(646) 582-9241
sfleishman@wolferesearch.com

Naaz Khumawala
Utilities & Power Research
WOLFE TRAHAN
420 LEXINGTON, SUITE 648
NEW YORK NY 10170
(646) 582-9243
NKhumawala@WolfeTrahan.com

(End of Appendix A)

Appendix B

Table of Violations and Offenses

Table of Violations and Offenses
San Bruno Investigation OII 12-01-007

Adopted No.	Alleged No.	Violation (abbreviated description; see applicable conclusion of law for full statement of violation)	Date (one-time violations)	Date Range (Continuing Violations)		Offenses (Pub. Util Code § 2108)		
				Pre-1994	1994 & forward	Pre-1994	1994 & forward	Total
1	4	Section 451 – Violation of ASME B31.1.8-1955 (§811.412(c)) by not conducting a hydrostatic test	-	12/31/56 - 12/31/93	1/1/94-9/9/10	13,515	6,096	19,611
2	5	Section 451 – Violation of ASME B31.1.8-1955 (§811.27(A) by failing to visually inspect segments	1956	-	-	1	0	1
3	6	Section 451 – Violation of API 5LX (§VI) by installing pups less than five feet	1956	-	-	1	0	1
4	8	Section 451 – Violation of ASME B31.1.8-1955 (§811.27(G)) by assigning a yield strength above 24,000 psi	1956	-	-	1	0	1
5	11	Section 451 – Violation of ASME B31.1.8-1955 (§811.27(C)) by using incomplete welds and failing to measure wall thickness	1956	-	-	1	0	1
6	10	Section 451 – Violation of Section 1.7 of API Standard 1104 (4th Ed 1956) by using defective welds	1956	-	-	1	0	1
7	12, 13	Section 451 – Violation of ASME B31.1.8-1955 (§845.22) by failing to meet MAOP requirements	1956	-	-	1	0	1
8	1, 2, 3	Section 451 – Violation of industry standards and specifications, including ASME B31.1.8-1955 (§810.1) by installing pipe unsafe for operational conditions	-	12/31/56 - 12/31/93	1/1/94-9/9/10	13,515	6,096	19,611
9	27	49 CFR 192.917(b) - Failure to use conservative assumptions	-	-	12/17/04 -9/9/10	0	2,093	2,093
10	15	49 CFR 192.917(b) - Failure to gather and integrate GIS data	-	-	12/17/04 -9/9/10	0	2,093	2,093
11	17	49 CFR 192.917(a) - Failure to analyze weld defects	-	-	12/17/04 -9/9/10	0	2,093	2,093
12	21	49 CFR 192.917(e)(2) - Failure to consider cyclic fatigue	-	-	12/17/04 -9/9/10	0	2,093	2,093
13	18	49 CFR 192.917(e)(3) - Failure to determine risk of DSAW threat	-	-	12/17/04 -9/9/10	0	2,093	2,093
14	19, 20	49 CFR 192.917(e)(3) - Failure to identify threats as unstable after pressure increase	-	-	12/17/04 -9/9/10	0	2,093	2,093
15	22	49 CFR 192.921(a) - Failure to use an appropriate assessment method	-	-	12/17/04 -9/9/10	0	2,093	2,093

16	26	49 CFR 192.917(c) - Use of improper risk ranking algorithm	-	-	12/17/04 -9/9/10	0	2,093	2,093
17	28	Section 451 - Creation of unsafe condition by avoiding hydrostatic testing or ILI	-	-	12/17/04 -9/9/10	0	2,093	2,093
18	29	49 CFR 192.13(c) - Failure to follow internal work procedures	9/9/2010	-	-	0	1	1
19	30	Section 451 - Failure to follow internal work procedures	9/9/2010	-	-	0	1	1
20	31	49 CFR 192.605(c) - Failing to have adequate written procedures	9/9/2010	-	-	0	1	1
21	32	Section 451 - Unsafe conditions at Milpitas Terminal	-	-	2/28/10- 9/9/10	0	194	194
22	38	49 CFR 192.615(a)(3) - Failure to respond promptly and effectively	9/9/2010	-	-	0	1	1
23	39	49 CFR 192.615(a)(1) - Failure to receive, identify, and classify notices	9/9/2010	-	-	0	1	1
24	40	49 CFR 192.615(a)(4) - Failure to provide resources at scene	9/9/2010	-	-	0	1	1
25	41	49 CFR 192.615(a)(6) - Failure to adequately perform emergency shutdown	9/9/2010	-	-	0	1	1
26	42	49 CFR 192.615(a)(7) - Failure to make hazards safe	9/9/2010	-	-	0	1	1
27	43	49 CFR 192.615(a)(8) - Failure to notify first responders	9/9/2010	-	-	0	1	1
28	44	49 CFR 192.605(c)(1) and (3) - Failure to have adequate emergency manual	9/9/2010	-	-	0	1	1
29	45	49 CFR 192.615(a)(2) - Failure to follow adequate procedures for communication with first responders	9/9/2010	-	-	0	1	1
30	53	49 CFR199.225(a) - Failure to perform alcohol tests	9/9/2010	-	-	0	1	1
31	34	Section 451 - Unsafe condition caused by emergency response deficiencies	9/9/2010	-	-	0	1	1
32	55	Section 451 - Unsafe condition due to budget cutting	-	-	1/1/08- 9/9/10	0	983	983
				Total Offenses		27,036	32,219	59,255

(End of Appendix B)